



Towards a joint monitoring programme for the North Sea and the Celtic Sea

ACTIVITY I – WORKSHOP Report of Final Event



July 2015



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The JMP NS/CS project partners are as follows: RWS (NL), RBINS (BE), MSS (UK/Scot), DTU Aqua (DK), IMARES (NL), CEFAS (UK/Eng), TI (GE), JNCC (UK/Eng), ILVO (BE), AU DCE (DK), IFREMER (FR), MI (IE), SLU (SE), SMHI (SE), SwAM (SE), IMR (NO), BfN (GE), BSH (GE).





Final results and future collaboration

The meeting: venue and date

The final event of the EU project Towards a joint monitoring programme for the North Sea and the Celtic Sea (JMP NS/CS) was organized by Rijkswaterstaat at LEF Future Centre in Utrecht, the Netherlands on 18 and 19 March 2015.

The project: aim and outcomes

The aim of the JMP NS/CS project is to develop new concepts and decision-making tools for MSFD implementation. Focus points are an inventory and analysis of monitoring metadata, international cooperation and multi-use of monitoring platforms, development of planning tools, and identification of gaps and needs. During 18 months, 18 partners from nine North Sea and Celtic Sea countries have worked together in this project. Exchange of information, partner meetings and hands-on workshops, statistical and other analyses have brought us to a point that we are proud to present a range of opportunities to enhance joint monitoring on the North Sea and Celtic Sea.

Life after JMP NS/CS?

60 persons were invited to bring their expertise and ambition for effective marine monitoring and engage in the discussions. The goal was to end the meeting by shaping potential contours of 'life after JMP NS/CS': is there willingness to continue cooperation among the partner institutions? If so, how to organize this? Invited were the Steering group of the project, the Policy liaison group and national monitoring programme managers.

Programme

Wednesday 18 March

15:30 registration and distribution of project summary report

16:00 start of the programme:

- welcome and getting to know each other
- gallery of project results
- dinner and networking
- experience and ambition for joint monitoring – plotting change potential

20:00 end of evening sessions

Thursday 19 March

8:30 walk in

9:00 start of the programme:

- story starter - icebreaker
- JMP NS/CS conceptual framework - introduction
- main project outcomes – dissemination and reflection in 3 rounds of parallel focus sessions

12:15-13:15 lunch

- main project outcomes – interpretation
- life after JMP: towards joint monitoring for the North Sea and the Celtic Sea
- observations, conclusions and ... action!

16:00 closure

Aims of the final event

For this event the following aims were identified:

- Formation of a living network and a leading coalition for future collaboration in monitoring North Sea/Celtic Sea
- Dissemination of project results by learning about what the project has achieved in gallery and focus sessions
- Reflection on meaning and usefulness of the results
- Interpret mechanisms of the current situation and recognize potential for change
- Identify follow up actions and recommendations towards joint monitoring for the North Sea and Celtic Sea: what and who.
- Recommendations for the European commission

Expected outcomes

- Understanding of joint monitoring and what the project delivered
- A strengthened network
- Clear ambition and commitment
- Inspiring plans and ideas on next steps

Workshop approach and techniques

During the workshop a four layered approach was used that is linked to four stages of a natural mental process that is used in guiding a group evaluation. The method enables people to discuss all the steps leading to a conclusion and helps to prevent people from immediately drawing conclusions.

The identified layers and work forms are:

1. **Actual Retrospect:** learn what the project has achieved in gallery and focus sessions
2. **Reflect and Connect** on the meaning and usefulness of results in small homogenous groups by plotting the change potential.
3. **Interpret** mechanisms of current situation and recognize potential for change. Give meaning to the project outcomes in focus group and plenary sessions.

4. **Continuation:** identify follow up actions towards joint monitoring for the North Sea and Celtic Sea in an “open space” break out session.

During the meetings we also used an online, interactive chat facility (MMS). Questions showed up on each participants own device (smart phone or tablet), could be answered on this device and all responses were shown on a large, central screen and could be liked by the participants. The results of this method are part of this minutes.

Participants

During the first day 36 participant were present and the second day 39. See Annex 1.

The participants could be characterised as follows: approx. 15% policy makers, 25% policy advisors, 25% (programme) managers and 35% scientists.

Annex 4 shows the answers to this question. Most reactions (about 30%) expected more concrete results. Also people wondered whether there is sufficient support for joint monitoring or whether stakeholders are adequately informed (25%). Recommendations were made with regard to good communication (20%). In addition, it was indicated that there should be more focus on new developments (15%) and that showing the costs of monitoring is important (10%). More detail and increased understanding of concrete results of the project during sessions on the second day of the workshop provided replies to some of the issues raised in this discussion.

Mechanisms of the current situation and potential for change (Layer 2 - Reflect and Connect)

After dinner homogenous groups of programme managers, policy makers, policy advisors and scientists were formed, clustered according to their roles towards joint monitoring. They worked out the sense of urgency and change potential for joint monitoring, on the basis of their own expertise and ambitions and replied in their groups to the questions:

- *Wat is our price and profit for collaboration in marine monitoring?*
- *What is our price and profit when individual monitoring remains?*
- *What becomes clear when you look at the completed matrix?*

The answers were plotted in a quadrant of Profit versus Loss and Joint Monitoring Succeeds versus Joint Monitoring Fails. See the policy makers version below and the results for all the other homogenous groups in Annex 5A.

Policy Makers		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
Profit What is our gain? And What does that mean to us?	<ul style="list-style-type: none"> • Improved knowledge on a larger scale • Agreement on ecosystem status • Rely on common outcome 	<ul style="list-style-type: none"> • Stay in comfort zone • No investments needed
Loss What is our loss? What do we need to release? And What does that mean to us?	<ul style="list-style-type: none"> • Accountability • Exclusive responsibility 	<ul style="list-style-type: none"> • Limited ability to take proper measures • Fail to comply with MSFD requirements for regional coordination

These plots give an insight in the change potential and the sense of urgency. A strong diagonal axis from top left to bottom right indicates a good potential for change. A strong diagonal from bottom left to top right indicates reluctance to change.

The plots were discussed in plenary. On the question (MMS 3) ‘Which conclusion can your group draw about their specific change potential concerning joint monitoring?’ the answers given were generally more analytical than advisory. However, if the answers are transformed into recommendations for change potential, it can be said that:

- Scientists recommend to promote the project results and emphasize the importance of joint funding;
- Policy makers ask for better advise;
- Policy advisors realize that they have to give more ‘fit for purpose’ advise and are aware that much time is needed for the realization of joint monitoring;
- (programme)managers emphasize that more transparency and stimuli are needed.

All answers can be found in Annex 5B.

Second day, 19 March 9-16h

Story Starter (Layer 3 - Interpret)

Before starting with the focus sessions a general question (MMS 4) was asked:

'About the (unwritten) rules of the game in my work: what do I need to do in order to be successful?'

Most of the answers focused on improvement of communication with management and the policy makers (about 25%). Also mentioned was improving scientific foundations and creating publications (about 20%), networking and cooperation with others (about 20%) and strengthening (internal) drivers and enthusiasm (about 20%). Finally, it was mentioned that time and money for projects on joint monitoring is important (about 15%). Annex 6 shows all answers.

Conceptual framework of JMP NS / CS (Layer 1 - Actual Retrospect)

In the morning Lisette Enserink shortly presented why the European Commission supports the JMP NS / CS project and how this project relates to two other projects under the same EU call, *ie.* BALSAM in the Baltic and IRIS-SES in the Mediterranean and Black Sea. She introduced the background and themes of the focus sessions (Annex 7).

Four focus sessions (Layer 3 - Interpret)

This was followed by four focus sessions. These enabled participants to gain more in-depth understanding of the project results. The information was structured in the same way as the summary report of the project. Participants could visit 3 of them in 3 rounds. During each of the sessions concrete results were presented, followed by a discussion.

The subjects of the focus sessions were:

- Session I: Policy perspective: how to initiate and facilitate joint monitoring; by Silvana Birchenough & Bill Turrell (Annex 8). Results of the discussion are in Annex 9.
- Session II: Achieving joint monitoring from a scientific perspective; by Gert van Hoey, Lisette Enserink and Steven Degraer, (Annex 10).
- Session III: Routes to collaboration; by Ingeborg de Boois and Marie Vanden Berghe (Annex 11 and <https://www.youtube.com/watch?v=zjEks3ibza0&feature=youtu.be>)
- Session IV: Tools for designing a joint monitoring programme; by Marco Rius, Julia Wischnewski and Ralf van Hal (Annex 12)

Insights from the four focus sessions (Layer 2 - Reflect and Connect)

After lunch in a plenary session the insights from the four focus sessions were shared. Annex 13 shows the result of the question (MMS 5) *'What is your insight?'*. Overall, the most reactions gave 'do it – just start' (30%). However, participants realized that it is 'difficult and a long way to go' (25%). 'Argue from an ecosystem point of view and from *we*, and not from *me/us*' and 'design fit for purpose' were other insights (20% and 10% respectively). Some remarks were about the importance of money and other drivers (15%).

- lack of funding to attend international fora
- national obligations rate higher for ministries therefore certain reluctance to think internationally in the first place

Risks / Uncertainties:

- We don't know whom to ask?
- Our bosses don't want us to.
- Not enough funding to participate in different international fora.

2. How to become friends with your policy maker?

Challenges:

- No clear requirements of MSFD (while having clear deadlines)
- Too many groups that deal with MSFD
- Irritates policy makers
- Policy makers focus on ministers next elections, not on 2020 GES -> mutual understanding
- Scotland high turnover rate of policy makers
- Need for Joint Monitoring starts with coherent assessment, North Sea is mobile system, what part is my national obligation?
- Money in 1 pot and EU to double it (BONUS+ programme instead of DCF)
- Potential triggers: Art 12 assessment risk of having similar notes in 6 years
- Needs better understanding of institutional context. Quite different between different countries. Governance expertise needed.
- Role of ICES – through OSPAR. Request for advice – to advise on GES boundaries
- Need support from Marine Director (MD)

Challenges which were considered most important:

- Investigate position of MD in your Member State
- Make a plan in your institute of who the PMS (policy managers) and MDs (marine directors) are.
- Show how you can serve other policy frameworks than MSFD, BHD, EU Biodiversity strategy.

MMS Feedback

- Common understanding of need for Joint Monitoring starts with joint understanding of GES, incl. targets.
- If you don't know your Policy Maker good enough, map Marine Director and related people with your institute.

3. North Sea virtual Marine Institute (NSvMI)

See for a presentation on the NsvMI Annex 16. The recommendations for this theme were grouped around two perspectives: one of a NSvMI and one of a working group route.

The North Sea virtual Marine Institute

- The Time is right, we have the momentum
- Some plans already exist
- Budget – depends on size
- Don't forget NOOS, EuroGOOS
- Interested are:
 - IMARES
 - ILVO
 - RBINS
 - RWS
 - DTU-AQUA

- SMHI
- Need Ministry support
 - so policy makers need to see what is in it for them
 - when do they get their money back?
- Match funding is about 1M euro - easily matched if shiptime used
- Must focus on specific issues, eg
 - benthic
 - D4 food-web
- Aim - concrete proposals for next round of MSFD
- What is needed to establish sustainable NSvMI ?
- Better use of spare time on vessels
- Support for few, small, achievable aims
- Get others involved
 - WG-ISUR
 - WG-INOSE
- Coordinate existing work and make it visible
- Interreg
 - very high bureaucratic overheads
 - poorly funded
 - some have 150k euro minimum limit
 - can hire contract management staff
- Other funding options
 - DG-ENV
 - new DCF

OR

A Working Group route?

- Not a virtual institute – as it is hard to sustain? But then how to give it visibility?
 - ICES ?
 - Or project to start, then ICES or OSPAR to pick up?
- Hesitant towards:
 1. INTERREG
 2. Virtual institutes, they come and go
- Next step
 - weekly skype
 - virtual document
- Commitment to contribute ideas

MMS Feedback

- Start small and concrete.
- Use benthos as first case.
- Avoid INTERREG
- Use ICES/OSPAR frameworks.
- Start club of weekly skype meetings.

4. Collaboration with your nearest neighbour

- Find the right contact person(s),
- Compare similar monitoring programmes,
- And check timing of monitoring,
- Then take intercalibration further.

5. Living network

- The people here in the JMP project are the living network, who can effect change in an evolutionary way; e.g. collaborating at the small scale to begin with e.g. with neighbouring countries to demonstrate it works
- Maintaining the already existing energy of the group
- What can members from the network bring back to the working groups of OSPAR and own organisation.
 - Write instructions for people attending international workshops stressing the guidance and reporting back the steps taken.
- Searching for how to coordinate further Joint Monitoring. For different quality elements. Across platforms.
- Have the checklist towards Joint Monitoring in mind
- Living network = contacts, LinkedIn Group
- Have a list of names of participants and in which fora you are involved. LinkedIn Group. Who are lacking? What are gaps?
- Do we need a new group? Often it is the same people attending working groups and international projects anyway.
- More official network meetings, symposia and projects
- Platform catalog of examples that can be done
- Network can be supportive to working together as neighbours
- Communicate with colleagues neighbouring countries.
- Why should we do this living network?
 - communicate, spread the word
 - make sure that steps of the checklist table are applied, e.g. the benthos case study.
 - lobbying
 - thoughts can be brought to the virtual network

6. Concrete actions that each user group can take, identify low hanging fruit (i.e. Prioritisation) and execute...

- Internally discuss joint monitoring in the institute, send round the 10-pager to colleagues, gradually getting people on board
- Present the JMP results to colleagues, and inform that the guideline is that you should do joint monitoring
- Incorporate joint monitoring in annual (national) monitoring plans to be implemented in next MSFD period. Needs (financial) support and clarification on the amount of capacity, money, benefits, etc.
- The MSFD could be re-interpreted by the Commission to have less emphasize on responsibility at the national level and more on the regional level
- Use the personal network of the scientists. Troubleshooting happens at the practical level. Work goes on even when there is some hick-up along the line on the political/management level.
- Convince ICES Science Committee to agree on the proposal for an ICES workshop to create an integrated survey in the North Sea based on the current time, space, shiptime of IBTS Q3, taking into account the current and new objectives
- Adopt ICES approach to develop international monitoring programmes
- Present JMP results to MonitBE (responsible for MSFD in Belgium), to gradually get people on board
- SMHI staff to SLU trip to collect more data than SLU does on their own cruise
- If it is a new parameter to be monitored develop monitoring in an international context (good example to start with: marine litter)
- For established monitoring develop intercalibration between national programmes



Conclusions and Closure

The meeting ended with a speech by Roeland Allewijn, the chairman of the JMP NS/CS steering group and Director at Rijkswaterstaat. Roeland emphasized that one of the main deliverables of the project was right in front of him: a network of marine monitoring professionals willing to explore and perform joint monitoring. The idea of a North Sea virtual Marine Institute is worth supporting and Rijkswaterstaat wants to be part of that process. He had followed the project and realized that useful options for further collaboration between institutes had been investigated and that institutional barriers were identified, *e.g.* different responsibilities between institutes and different approaches in marine monitoring.

The main question is: how to intensify collaboration, while taking account of these differences? From experience Roeland does not expect that we will solve all issues at once, it will rather be a stepwise process and the project has developed a useful checklist that supports integration. We should start with the 'low hanging fruit', explored in the case studies Elasmobranchs, benthos and chlorophyll.

With regard to the latter, Roeland referred to his personal involvement in the start of oceanographic operational collaboration (EUROGOOS) in the 1990's and his enthusiasm for using Remote Sensing in marine observation. Twenty years later this still is a 'promising' approach for chlorophyll monitoring, while techniques have been refined significantly ever since. The current interest from policy in better coherence and cost effective monitoring may now provide the final push to use such techniques in marine monitoring and assessment for EU Directives.

Roeland thanked the JMP NS/CS consortium for the hard work and fruitful cooperation and expressed his wish that one way or another the North Sea and Celtic Sea collaboration will continue and that the benefits of joint monitoring will help us to perform our tasks.



Thank you!

Annex 1. Participants to the JMP NS/CS Final Event

NAME	ORGANISATION	COUNTRY	18 March	19 March
Steven Degraer	RBINS	Belgium	x	x
Marie Vanden Berghe	RBINS	Belgium	x	x
Gert Van Hoey	ILVO	Belgium	x	x
Hans Polet	ILVO	Belgium		x
Thomas Kirk Sørensen	DTU aqua	Denmark	x	x
Marie Storr-Paulsen	DTU aqua	Denmark	x	x
Jens Würgler Hansen	AU DCE	Denmark	x	x
Henrik Fossing	AU DCE	Denmark	x	x
Bruno Ernande	Ifremer	France	x	x
Jean Paul Lecomte	Ifremer	France	x	x
Jérôme Baudrier	Ifremer	France	x	x
Alain Lefebvre	Ifremer	France	x	x
Julia Wischnewski	TI	Germany	x	x
Marco Rius	TI	Germany	x	x
Jochen Krause	BfN	Germany	x	x
Donal Cronin	DECLG	Ireland	x	x
Marjolijn de Graaf	LEF future center	The Netherlands	x	x
Marinda Hall	LEF future center	The Netherlands	x	x
Lisette Enserink	RWS	The Netherlands	x	x
Jolande de Jonge	RWS	The Netherlands	x	x
Hans Rooter	RWS	The Netherlands	x	x
Roeland Allewijn	RWS	The Netherlands		x
Jeanette Plokker	RWS	The Netherlands	x	x
Kees Borst	RWS	The Netherlands	x	x
Maurits van der Heijden	RWS	The Netherlands		x
Gerrit Vossebelt	RWS	The Netherlands	x	x
Hanneke Baretta-Bekker	Baretta-Bekker Mariene Ecologie	The Netherlands	x	x
Carien van Zwol	min. of I&E	The Netherlands		x
René Dekeling	min. of I&E	The Netherlands	x	
Wilmar Remmelts	min. of EA	The Netherlands	x	x
Ralf van Hal	IMARES	The Netherlands	x	x
Ingeborg de Boois	IMARES	The Netherlands	x	x
Gerjan Piet	IMARES	The Netherlands		x
Maria Hansson	SLU	Sweden	x	x
Pia Anderson	SMHI	Sweden	x	x
Karl Norling	SwAM	Sweden	x	x
Bill Turrell	MSS	United Kingdom	x	x
Colin Moffat	MSS	United Kingdom	x	x
Silvana Birchenough	CEFAS	United Kingdom	x	x
Kerstin Kroeger	JNCC	United Kingdom	x	x
Jo Foden	OSPAR	United Kingdom	x	x

Annex 2. Gallery




Enjoy the Museum of the Joint Monitoring North Sea/Celtic Sea project results







Partners in the JMP NS/CS project

1. MI	10. TI
2. MSS	11. BSH*
3. JNCC	12. BfN*
4. CEFAS	13. DTU Aqua
5. Ifremer	14. AU DCE
6. ILVO	15. IMR*
7. RBINS	16. SwAM*
8. RWS	17. SMHI
9. Imares	18. SLU

* non funded partner

Joint monitoring
Multi-discipline: multiple aspects in an integrated design
Multi-party: combined monitoring by multiple organizations

Conceptual framework / Policy perspective
 Silvana Birchenough & Bill Turrel

Current state of monitoring:

- Fisheries:
 - EU coordinated and paid, executed nationally at ecosystem scale
 - common indicators and assessment
- Environmental:
 - ranging from national coordination to OSPAR wide,
 - paid nationally and executed in national waters
- MSFD Art 12 assessment raises need for more coherence of assessment outcomes

Tangible benefits:

- Cost Effectiveness : increasing monitoring efficiency by sharing platforms, personnel, avoidance of redundancy etc
- Sharing expertise: more coherence in methods and improved comparability of assessment
- Regional scale: less misinterpretation of signals on national scales
- Integrated monitoring: a better understanding of ecosystem functioning
- Data sharing: increased scientific evidence and easier reporting at international geographic scales

Recommendations:

- Improve coordination
- New funding mechanisms
- Simplify permit process
- Share metadata databases
- Go for standardized methods
- Common reporting

From monitoring to assessment
Scientific perspective
 Steven Degraer & Bruno Ernande

Current state:

- Development of common indicators for MSFD ongoing. Consensus on metrics, targets and thresholds difficult to achieve
- Reluctance to breach long time series
- Intercalibration to bridge differences in indicator specification and processing

Scenarios for joint monitoring of chlorophyll, benthos and elasmobranchs:

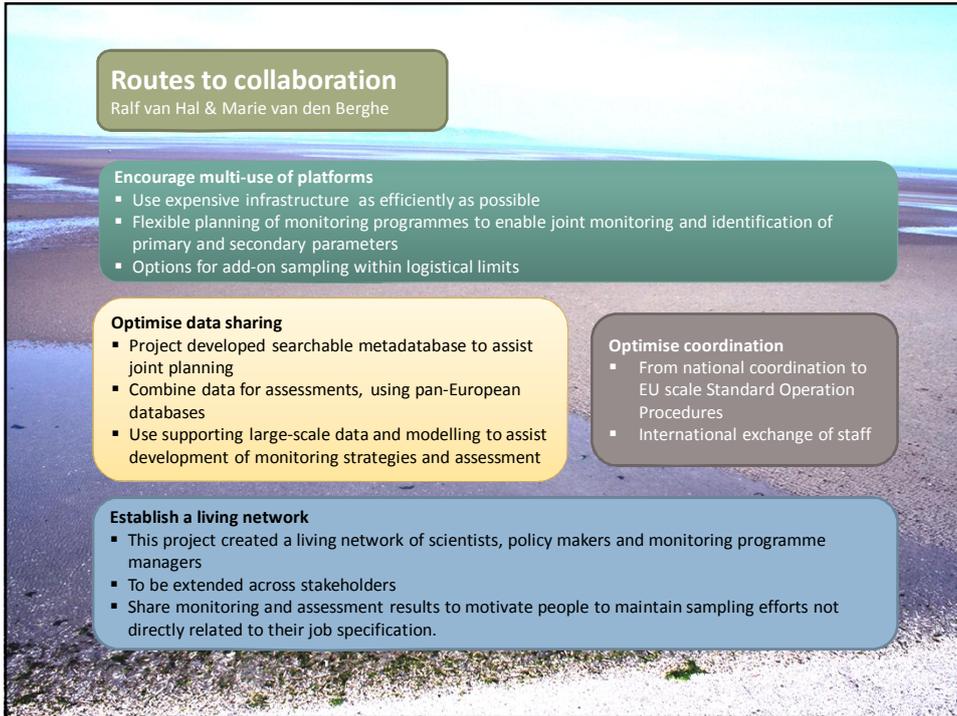
- Construction of business as usual from variety of sources
- Identification of similarities and differences between countries in interpretation of common indicators, targets, baselines
- Same for sampling design and analytical methods
- Limitations in intercalibration
- Assumptions needed to develop joint scenarios

Improved assessment at ecological relevant scale requires:

- Transition from locally developed indicators to common indicators
- Use of innovative techniques to enhance data collection, processing and interpretation
- Harmonization where useful

Challenges:

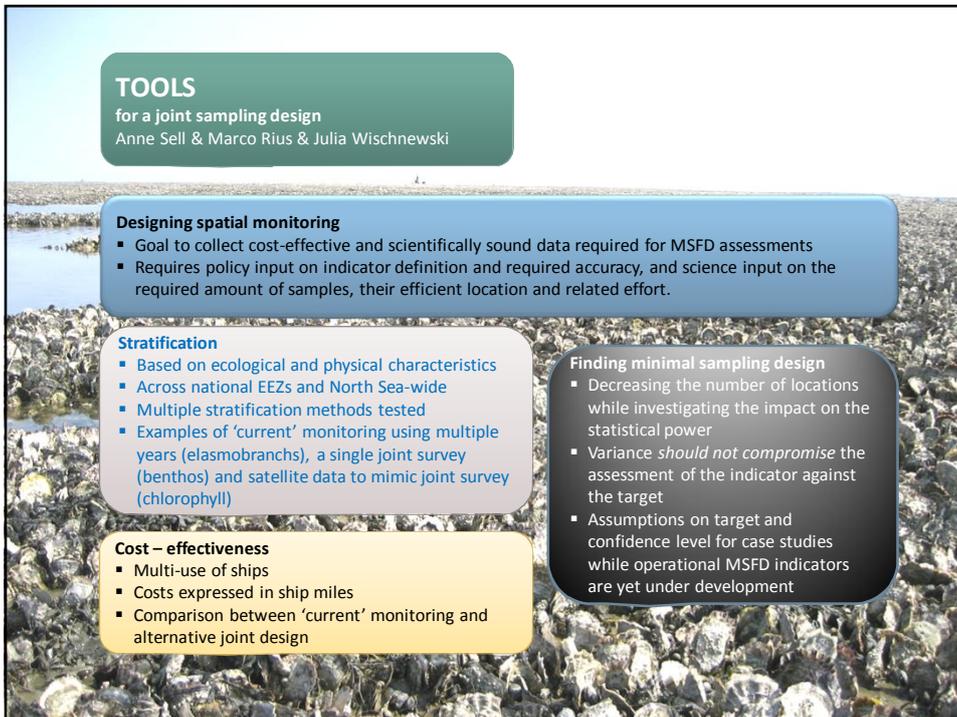
- Iteration between development of indicators and monitoring design
- Monitoring and assessment at relevant spatial and temporal scale



Routes to collaboration

Ralf van Hal & Marie van den Berghe

- Encourage multi-use of platforms**
 - Use expensive infrastructure as efficiently as possible
 - Flexible planning of monitoring programmes to enable joint monitoring and identification of primary and secondary parameters
 - Options for add-on sampling within logistical limits
- Optimise data sharing**
 - Project developed searchable metadatabase to assist joint planning
 - Combine data for assessments, using pan-European databases
 - Use supporting large-scale data and modelling to assist development of monitoring strategies and assessment
- Optimise coordination**
 - From national coordination to EU scale Standard Operation Procedures
 - International exchange of staff
- Establish a living network**
 - This project created a living network of scientists, policy makers and monitoring programme managers
 - To be extended across stakeholders
 - Share monitoring and assessment results to motivate people to maintain sampling efforts not directly related to their job specification.



TOOLS

for a joint sampling design
Anne Sell & Marco Rius & Julia Wischniewski

- Designing spatial monitoring**
 - Goal to collect cost-effective and scientifically sound data required for MSFD assessments
 - Requires policy input on indicator definition and required accuracy, and science input on the required amount of samples, their efficient location and related effort.
- Stratification**
 - Based on ecological and physical characteristics
 - Across national EEZs and North Sea-wide
 - Multiple stratification methods tested
 - Examples of 'current' monitoring using multiple years (elasmobranchs), a single joint survey (benthos) and satellite data to mimic joint survey (chlorophyll)
- Cost – effectiveness**
 - Multi-use of ships
 - Costs expressed in ship miles
 - Comparison between 'current' monitoring and alternative joint design
- Finding minimal sampling design**
 - Decreasing the number of locations while investigating the impact on the statistical power
 - Variance *should not compromise* the assessment of the indicator against the target
 - Assumptions on target and confidence level for case studies while operational MSFD indicators are yet under development

CASE STUDY Chlorophyll-a

Common indicator for eutrophication
Lisette Enserink

Current state

- Differences in sampling design and analytical methods hamper cross-country comparison
- Intensive ship-based national monitoring programmes

Intended change

- Increased use of remote sensing for the entire North Sea
- Calibration surveys using a joint design
- Reducing ship time and chemical analyses

Challenge

- Need for area-specific calibration (coastal waters)
- Agreement on analytical methods and assessment criteria
- Operational collaboration

CASE STUDY Benthic

Indicator for habitat condition
Gert van Hoey

Current state

- No common indicator, but common metric (species abundance)
- Programmes on a national scale
- Gives restricted assessments
- And expensive surveys

Intended change

- Broad scale benthic monitoring design for North Sea, based on national programs
- Using common strata and agreed sampling and processing protocols
- Ships of opportunity

Challenge

- Agree on protocols
- Install international body for co-operation
- Create better value for money

As joint monitoring can be seen as an iterative process and not a one-time fix, it depends on the status quo where the easiest benefits of joint monitoring can be achieved.

This checklist contains the crucial steps to move towards multi-party joint monitoring.

Guidance for joint monitoring

Jolande de Jonge & Thomas Kirk Sørensen

HOW TO ACHIEVE MULTI-PARTY JOINT MONITORING

Phase	Activity or initiative to facilitate joint monitoring	Joint next steps
	To develop joint monitoring initial joint workshops will be needed involving scientist and policy makers or funders to agree principles. These will need to be followed up by scientific workshops to develop detailed strategies and methods.	
→ Objectives	Identify monitoring objectives of each party. Are there previously agreed monitoring objectives?	Agree on common objectives.
→ Indicators	Identify indicator(s) used by each party. Are there previously agreed indicators?	Agree on common indicator(s).
→ Parameters	Identify parameters measured by each party. Identify standards used.	Agree on common parameters to measure and which standards to use.
→ Sampling Method	Identify sampling methods used by each party, or for new survey. Identify common sampling method.	Agree standardized sampling method, or cross calibrate between methods if standardization cannot be agreed.
→ Sampling Platform	Identify suitable available sampling platforms in all countries.	Agree on sampling platforms to use.
→ Sampling Design	Identify sampling designs and strata used in each country.	Agree across country strata and combined sampling design (dependent on all others steps).
→ Analytical Method	Identify analytical methods and standards used by each country.	Agree standard methods to use, or cross calibrate if standardization cannot be agreed.
→ Data Management	Identify common formats, standards and sharing protocols.	Agree on common formats and standards, or standardization protocols if common formats cannot be agreed.
→ Assessment	Do the data collected contribute appropriately to the assessment methods (either common or separate assessment methods)?	Either amend data collected, or amend assessment method.
→ Report	Identify if reporting is to be separated by country, or combined.	Share data to ensure scientific conclusions are common (administrative or political conclusions may differ).
→ Funding	Arrange long term solutions such as a central funding source across countries with incentive to cooperate (e.g. EU Data Collection Framework).	Agree regional funding mechanisms.
→ Do Not Forget	Assess scientific and cost benefits of monitoring (or just sampling?) jointly against monitoring by individual countries.	Decision whether to sample jointly between countries may be affected by political considerations.

Annex 3. MMS question 1

The answers were categorised in three groups, the number of answers in each category are given as well as the percentages.

- | | | |
|------------------------------|------|--------|
| 1. Di = Dissemination | nr=5 | ca 30% |
| 2. Ne = Next (life after...) | nr=7 | ca 40% |
| 3. Nw = (living) network | nr=5 | ca 30% |

What expectations do you have of this meeting?

- 1 Knowledge of the steps we will be taking next. **Ne**
- 2 Networking, Improving coordination between national marine monitoring **Nw**
- 3 Fun and games all day long. And some joint monitoring. **Nw**
- 4 Networking **Nw**
- 5 to get a best knowledge of the JMP project **Di**
- 6 That we have a plan forward towards joint monitoring. **Ne**
- 7 Start for a new round of joint monitoring **Ne**
- 8 Hopefully creating a basis for new collaboration **Ne**
- 9 to receive some good, practical advice about how to conduct joint monitoring **Ne**
- 10 An open face, trust, concrete results. Joy. **Nw**
- 11 inspiring results out of the box and practical at the same time **Di**
- 12 Find out what was going on **Di**
- 13 Learn all about joint monitoring I was afraid to ask.... **Di**
- 14 Inspiring discussions, good questions and fun! **Di**
- 15 Have fun with colleagues from NS **Nw**
- 16 To get to know about the next step, **Ne**
A good dinner tonight
- 17 Tomorrow a consensus how to continue JMP **Ne**
- 18 Good food
- 19 No idea

Annex 4. MMS question 2

The answers were categorised in five groups, the number of answers in each category are given as well as the percentages.

CS = Cost (questions and remarks about costs)	nr=3	ca 10%
S = Support (sufficient support; sufficiently known?)	nr=3	ca 25%
D = Disappointed in the results (expected more concrete results)	nr=7	ca 30%
CM = Communication (recommendations)	nr=5	ca 20%
F = focus on new developments	nr=4	ca 15%

What is your reaction to the project results?

- 1 Elephant in the room is that fisheries monitoring is funded and environment is not **CS**
- 2 A summary of the problems with few solutions **D**
- 3 A joint monitoring programme should speak with one language ie the same message should be said to all participating countries **CM**
- 4 Still need policy support and buy in **S**
- 5 Our monitoring problems are very specific, but the project has focused on generalities **D**
- 6 Use the regional coordination groups (RCG) for coordinating more than fisheries **CM**
- 7 Do enough people want change? **S**
- 8 Sensible, although lots of the results were already known **D**
- 9 A principle policy driver is cost effectiveness and always will be **CS**
- 10 Question to commission - do you want to fund non fisheries monitoring? **CS**
- 11 How can we generate a critical mass and momentum to move forward **CM**
- 12 Policy colleagues feel new to the results of the project **S**
- 13 National boundaries still restrict us **CM**
- 14 Inter department barriers also stop progress **CM**
- 15 Challenging. It is only the start, but... It gives a lot of energy! **S**
- 16 It is good to make more use of more innovation **F**
- 17 Environment monitoring is somewhat self-serving and not focused on the policy requirements **S**
- 18 It is easier to propose joint monitoring for new ..monitoring eg noise **F**
- 19 Policy departments may not be the bottleneck, but lie elsewhere ie institutes? **S**
- 20 Where are the results? It's not clear. How to go forward. Concrete ideas, tools. **D**
- 21 ICG MAQ needs hard and fast tools **D**
- 22 Why didn't the project achieve the science in one year which we haven't achieved in 20? (Ie too high expectations) **F**
- 23 Project ended too soon. **D**
- 24 Wanted better case studies, like stomach analysis - it would have integrated ecosystem science and fisheries **D**
- 25 One MS nation has lost vessel. Did that promote more joint monitoring. **F**

Annex 5A: Plotting Change Potential

(Program) Managers		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
Profit What is our gain? And What does that mean to us?	<ul style="list-style-type: none"> Stimulus for coordinated monitoring approaches Higher levels of transparency (-> cross border cooperation) Idea of where harmonization may be profitable / feasible Better cost efficiency 	<ul style="list-style-type: none"> Stronger Member State position to “combat” EC
Loss What is our loss? What do we need to release? And What does that mean to us?	<ul style="list-style-type: none"> Loss of institutional diversity – scientific resilience to deal with local issues Responsibilities and influence control ... (financial resources and results) 	<ul style="list-style-type: none"> Lack of knowledge transfer

Policy Makers		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
Profit What is our gain? And What does that mean to us?	<ul style="list-style-type: none"> Improved knowledge on a larger scale Agreement on status Rely on common outcome 	<ul style="list-style-type: none"> Stay in comfort zone No investments needed
Loss What is our loss? What do we need to release? And What does that mean to us?	<ul style="list-style-type: none"> Accountability Exclusive responsibility 	<ul style="list-style-type: none"> Limited ability to take proper measures Fail to comply with MSFD requirements for regional coordination

Policy Advisors 1		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
<p>Profit</p> <p>What is our gain? And What does that mean to us?</p>	<ul style="list-style-type: none"> • In my job: move into new areas • More international collaboration • Finally I get results from my “lifetime” effort to streamline and harmonize monitoring and data management • We will understand each other easier because of common language • I will be able to publish about successful JMP and become a scientist • Export methods to other areas (geographic, thematic and/or larger scale) 	<ul style="list-style-type: none"> • Keep my position; playing a game I know • Lessons learnt will help me in the next round • Opportunity to try again • Increased confidence to say in Brussels that we don't need to change BAU
<p>Loss</p> <p>What is our loss? What do we need to release? And What does that mean to us?</p>	<ul style="list-style-type: none"> • Less power to influence decisions • Disagreement keeps us busy -> we will lose our job • People still in business need to go to more meetings • Messenger of bad news: you need to change your familiar method • National identity / top position on specific expertise 	<ul style="list-style-type: none"> • Frustration that my efforts to harmonize etc. have failed. • More emphasis on national work and loss of international perspective • Loss of credibility

Policy Advisors 2		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
<p>Profit</p> <p>What is our gain? And What does that mean to us?</p>	<ul style="list-style-type: none"> • Coordinated data going to the Commission • RSCs have a strong role: OSPAR becomes more important • Assessment of environmental conditions is harmonised • More efficient (cheaper) monitoring makes more money available for something else e.g rivers monitoring • International network of people; better cooperation 	<ul style="list-style-type: none"> • Managers will have one decision less to make • Less risk of losing jobs • Save time in the short term (and money) • Policy makers don't have to make any changes to the basis on which they rely • Policy advisors won't have unhappy scientists
<p>Loss</p> <p>What is our loss? What do we need to release? And What does that mean to us?</p>	<ul style="list-style-type: none"> • Loss of national autonomy in making monitoring decisions • Obligated to harmonise methods and analytical techniques may require more investments • International collaboration could cost more initially • Fear of the unknown. Have to learn to trust new people 	<ul style="list-style-type: none"> • At risk of national budget cuts that will reduce monitoring and impoverish the information on which advice is given • No harmonised assessment of regional seas will make EU commission unhappy • Reflects badly on the policy advisors (and Member States) • Missed chance for more efficient monitoring • Lack of ambition. How to explain this to the next generation if we fail?

Scientists 1		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
<p>Profit What is our gain? And What does that mean to us?</p>	<ul style="list-style-type: none"> • Standardized <ul style="list-style-type: none"> ➢ easy to compare, ➢ decreases variability • End result: Quality • Better value for money = cost effective • Administrative burden: permits • Evaluate and Learn <ul style="list-style-type: none"> ➢ Transparent ➢ Collaboration / exchange • Common data -> Access 	<ul style="list-style-type: none"> • Continue as is -> comfort zone • National flexibility • National expertise
<p>Loss What is our loss? What do we need to release? And What does that mean to us?</p>	<ul style="list-style-type: none"> • Result: less funding • Loss of time series (climate) • Loss of National Expertise <ul style="list-style-type: none"> ➢ flexibility 	<ul style="list-style-type: none"> • No regional assessment

Scientists 2		
	Joint Monitoring NS/CS Succeeds	Joint Monitoring NS/CS Fails
<p>Profit What is our gain? And What does that mean to us?</p>	<ul style="list-style-type: none"> • “Better” data <ul style="list-style-type: none"> ➢ Ecosystem wide ➢ Multi-disciplinary ➢ Scale interactions • More robust assessments • Better understanding • Collective scientific progress 	<ul style="list-style-type: none"> • Save time - Business as usual • Stay in “comfort zone” • “I told you so!” – can gloat
<p>Loss What is our loss? What do we need to release? And What does that mean to us?</p>	<ul style="list-style-type: none"> • Losing jobs, resources, budget • “Control”(eg others publish my data) • Local expertise • [Loss of research time / opportunities – but not only related to Joint Monitoring] 	<ul style="list-style-type: none"> • Loss of money • Loss of morale – stagnation • Loss of opportunities • Loss of “succeeds” gains

Annex 5B. MMS question 3

Which conclusion can your group draw about their specific change potential concerning joint monitoring?

SCIENTISTS

- 1 Pros and cons are quite balanced although it may depend on their relative weighing, which in turn will depend on people. One issue then is to promote the project's results.
- 2 Promotion towards managers may mostly depend on financial aspects and money savings. Likewise, the operational route towards JMP may depend on a joint funding scheme.
- 3 Science 1
 - MSFD monitoring part of entire monitoring program
 - standardization needed for a regional assessment
 - comparable
 - increased quality
 - cost effective
 - transparent
 - reduced variability
 - data easily accessibleWith
 - attention for long term series

POLICY MAKERS

- 4 Assumption: JM --> improved knowledge on a larger scale and common agreement on status --> improved/sound decisions and measures

POLICY ADVISORS

- 5 As policy advisor I should be encouraged to go on for the next round to finish the job. It is now only a first start. There is a lot to do - in policy advising - to really reach the next level !!
- 6 If JMP succeeds it has positive influence and encourages to go the next steps in implementing the joint monitoring. This programme is but the first step on a long and rocky road.
- 7 Harmonisation of monitoring (and assessment) can be facilitated through Regional Seas Conventions. OSPAR coordination could make the job easier for Member States and will make the EU Commission happy.
- 8 Joint monitoring is a very long process so less than a project can be a success
- 9 More joint monitoring will lead to more (cost) efficient monitoring and a better harmonised assessment of the whole North Sea.
- 10 In my group more energy for change than for maintaining BAU. Positive attitude for international collaboration, although content of my job could change.
- 11 Emphasize the advantage of improved assessment due to joint monitoring to reach a healthier North Sea
- 12 My actions more focused on standardisation of exchangeable data. Not so much on harmonisation of monitoring.
- 13 More joint monitoring will initially cost more time and money, do we have this?
- 14 JMP results in efficient and robust environmental condition assessment

(PROGRAMME) MANAGERS

- 15 Coordinated monitoring approaches more transparent, comparable and cost efficient. If successful knowledge could be transferred to other regional seas and EU areas...
- 16 More efficient harmonised (cheaper) monitoring makes more money available for something else. And gives a better impression about the quality of the North sea
- 17 Dealing with profits, i.e. stimulus for coordinated monitoring, higher level of transparency between MS, identifying possibilities for harmonisation and the losses for different institutions

Annex 6. MMS question 4

About the (unwritten) rules of the game in my work: what do I need to do in order to be successful?

1 Collaborative, communicative, consistent, innovative C	4
2 Be enthusiastic (and engaged) E	4
3 be myself E	3
4 Show that you have the overview if what is going on in this field S	3
5 Cooperation C	3
6 Have commitment from the different management levels P	2
7 To start my own business E	2
8 good networking P	1
9 Safety first Open for new oportunities Cooperation C	1
10 To be honest and strategic E	1
11 Get project - with a lot of overhead T	1
12 Being pro-active and going the extra mile. E	1
13 Collaborate, publish, international experience C	1
14 Publish your work S	1
15 Be open to changing roles and responsibilities P	1
16 To be a good communicator with different audiences; scientists, data managers, policy advisors, policy makers P	1
17 To bring our tasks in an international scope and contribute to that S	1
18 <i>(deleted; the same answer as 22)</i>	1
19 Get money. T	0
20 Write peer reviewed scientific manuscript S	0
21 Deliver results S	0
22 Talk a lot with middle management and directors P	0
23 Commitment P	0
24 To become an expert in a specific field S	0
25 Express your ideas as much as possible S	0
26 good networking C	0
27 So far I get away with doing (mostly) what I like.... E	0
28 Overview, focus, good network and prepare to take actions E	0
29 To shut up, not be too engaged in something special and follow the money. Not	0

	to be pushy, have a lot of patience waiting for a decision. T	
30	Be communicative P	0
31	Make your work, outputs a part of the management cycle P	0
32	need committed scientists, a lot of money from the government and EU T	0
33	Publish or perish but also monitor or perish and advise or perish and bring funds or perish ?	0
34	Balance between science, management and politics C	0
35	Find allies in foreign countries. And the EC C	0
36	To tell others and make them enthusiastic for the european marine agenda P	0
37	ability to organise the work with acceptance of other organisations T	0
38	Be a step ahead. See what is on the horizon and establish networks. C	0

The answers were categorised in five groups, the number of answers in each category are given as well as the percentages. Behind the answers these categories are shown in red as well as the number of likes.

S = More science, more publication	nr=7	ca 20%
P = Better communication with / convincing of policy makers/management	nr=9	ca 25%
T = Time en money (project space, money)	nr=5	ca 15%
C = Connecting (collaboration, cooperation)	nr=8	ca 20%
E = (Internal) driver, enthusiasm	nr=7	ca 20%

Annex 7. Conceptual Framework

Towards a Joint Monitoring Programme for the North Sea and the Celtic Sea (JMP NS/CS)

Final Event at LEF Future Center,
Utrecht, 18-19 March 2015

contact: lisette.enserink@rws.nl



**DG ENV Pilot Project - New Knowledge for an integrated
management of human activities in the sea**

Grant Agreement No. 07.0335/2013/659567/SUB/C2

**Towards a Joint Monitoring Programme for
the North Sea and the Celtic Sea
(JMP NS/CS)**

**Final Event at LEF Future Center,
Utrecht, 18-19 March 2015**

contact: lissette.enserink@rws.nl



**Context of the JMP project
EC perspective**

Develop new concepts and decision-making tools for MSFD implementation:

- integrated monitoring strategies based on existing sampling and scope potential for joint monitoring programmes within and between MS;
- to support MSFD and other environmental legislation;
- at sea-region scales;
- cooperation between pilot projects and transferability of results between regions

Drivers: MSFD requirements for coherence (Art 12 assessment), meaningful assessments of quality status, budgets.



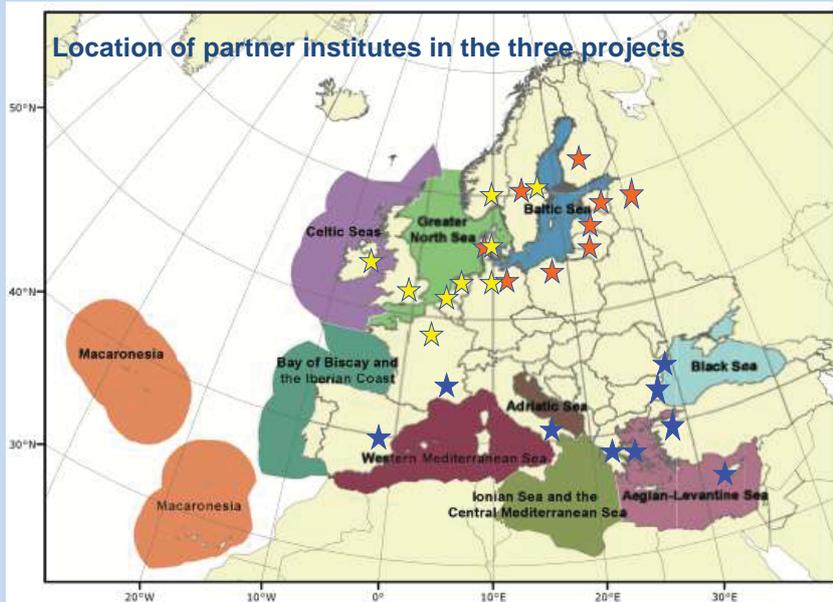
Context of the JMP project

3 projects under this call

	JMP NS/CS	BALSAM	IRIS-SES
Area covered	North Sea Celtic Sea	Baltic Sea	Mediterranean & Black Sea
RSC	OSPAR	HELCOM	Bucharest, Barcelona
# MS	8+ Norway	8+ Russia	7+ Turkey
# partners	18	19	9
M€	1	0.46	1.2
% EU contribution	77	89	72



Location of partner institutes in the three projects



JMP NS/CS results: focus session 1

Policy perspective: how to initiate and facilitate joint monitoring

- examples of cooperation, barriers, ways forward
- outcomes of workshops
- Silvana and Bill



JMP NS/CS results: focus session 2

Scientific perspective - from monitoring to assessment

- better quality through joint approaches
- indicator – monitoring - assessment
- case studies, especially chlorophyll and benthos
- Steven, Gert, Lisette



JMP NS/CS results: focus session 3

Routes to collaboration: multi-use of platforms, an information platform and a living network

- Examples of multi-use, limitations, benefits, how to coordinate
- How we developed the joint metadatabase and how it can be used
- Options for enhancing network and operational collaboration
- Ingeborg and Marie



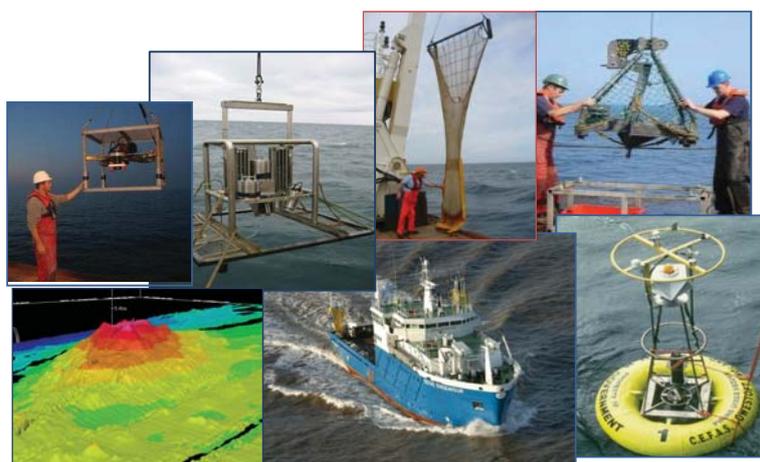
JMP NS/CS results: focus session 4

Tools for designing a joint monitoring programme

- Regional scale assessments, statistical tools, how to reduce costs
- All case studies, especially sharks and rays
- Marco, Julia, Ralf



Annex 8. Policy perspective: how to initiate and facilitate joint monitoring



***Policy perspective: how to initiate and facilitate
joint monitoring***

Silvana Birchenough & Bill Turrell



Achieving joint monitoring



Improve International co-ordination

- Previous discussions on best way to coordinate monitoring programme
- More active science to policy interactions (ICG-MSFD, The Dogger Bank example: long-term plan for monitoring)
- Winners and losers (skills, data, money, etc.)
- MSFD (driver): indicators, power analyses, risk based designs
- Existing coordination methods (OSPAR, ICES HELCOM, etc.)
- Practical level: permits=>cross border sampling (country is represented)





Funding models

- Fisheries example (centralized pot of money, wider benefits for all parties, no of countries)
- EU/country level agreement
- Concentrate on the greater monitoring gains (e.g. benthos case study, wider assessments)
- Seek long term solutions: data sharing, joint planning and multi-party vessel/monitoring groups
- Existing small pots of money (ICES: strategic science fund, DG-Env.)

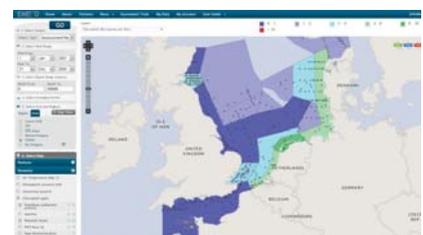
10-11th Septemebr at Europa House,
London



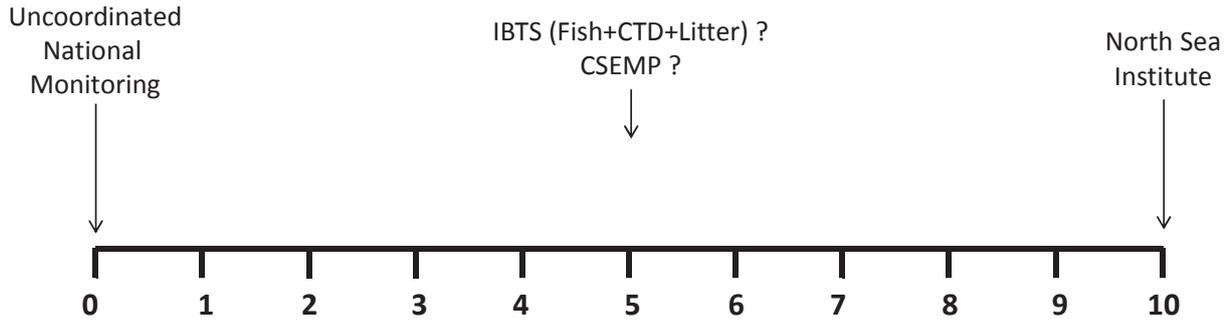
Data availability/sharing, reporting and assessment

- Data needed for assessments
- QSR (2017)- clear need for data for a regional analysis
- Clear need to feed data for an overview assessment
- Agreed standardized methods (depending on the organisations, multi-party integration up-front)
- MS can choose different indicators (leading to additional set of indicators).
- Data protection issues, as most countries will have dedicated restrictions (e.g. only share analyzed data sets, metadata)
- MS would like to share data products (e.g interpreted maps) rather than raw data
- Emodnet: Centre for data submission (EU Comm's support)

JMP final Meeting
Utrecht, 19th March 2015



Where Are We Now?

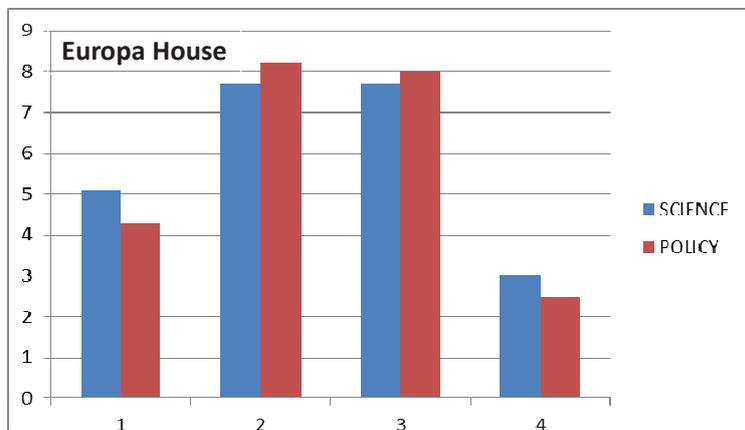


1. What level of "Joint Monitoring" would be politically acceptable ?
2. What level of "Joint Monitoring" would be cheapest ?
3. What level of "Joint Monitoring" would be scientifically most robust ?
4. Where on the scale is MSFD monitoring in the North Sea / Celtic Sea today ?

0 = No Coordination

5 = IBTS/CEMP

10 = North Sea Institute



1. Politically acceptable ?

Hi=7 Lo=2

2. Cheapest ?

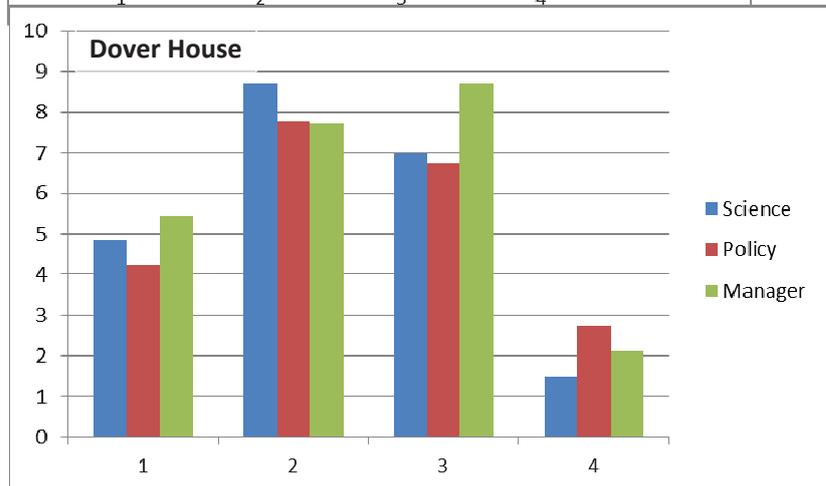
Hi=10 (4 scientists, 1 policy) Lo=5

3. Scientifically robust ?

Hi=10, Lo=5

4. Today ?

Hi=4, Lo=0



Annex 9. POLICY PERSPECTIVE – short notes of focus sessions

By Silvana Birchenough and Bill Turrell

Session 1 Discussion

Improving International Coordination

- In terms of Hazardous Substances, OSPAR coordinates “parameter lists” but not spatial coverage. It is OSPAR’s only “joint” monitoring BUT it is not coordinated with fisheries / ecosystem monitoring.
- Keeping JAMP/CEMP should not be a barrier to future changes in the programme to allow “joint” monitoring, eg Hazardous Substance monitoring on fishery surveys.
- Do not overlook other coordinating mechanisms other than OSPAR and ICES, e.g.
 - Eurofleet
 - Industry (eg aggregates)
 - Military

Funding

- Questions:
 - do we want environmental monitoring that is as high quality as the current fisheries monitoring
 - A – the monitoring should be the minimum needed to address MSFD needs
 - A – we are required to have coordinated, coherent monitoring
 - is fishery monitoring too data hungry?
 - it is because fish advice support economic activity
 - fishery data is all about numbers of samples and not quality
 - Many countries are setting their MSFD response to minimise cost, or stay cost-neutral
 - We have different time scales:
 - a long term perspective – define GES
 - short term perspective – what can we do with existing data

Data Availability

- Ambition exists to work towards common databases.
- What organisation should facilitate better data sharing ?
 - OSPAR is an obvious one.
 - but there is such a plethora of data bases / initiatives – the environment is confused and needs streamlining
- Sounds like project has focussed on status data, and not pressure data
 - MSFD needs pressure data

Session 2 Discussion

International Coordination

- How do we make sure the correct organisations within an MS are included in the communication link ??????

Funding

- when environment outweighs fishery in terms of political profile, then the monitoring will be funded
- The Commission could take two approaches
 - stick approach – infract if you don’t monitor
 - carrot approach – we will help you with your monitoring
- Commission not helping process currently – they should consider a carrot approach

Session 3 Discussion

International Coordination

- Have we really analysed which monitoring in our region is working well, and which is not ?
- Joint monitoring is not new. Perhaps modern IT has introduced complexities that are a barrier to progress
- Can't see anywhere in project analysis of existing monitoring [It was noted that this has occurred in the case studies – chlorophyll, elasmobranchs, benthic]
- Within OSPAR measuring hazardous substances has been a great success, monitoring biological effects has been a disaster. This has lessons to be learnt – ie good practice and poor performance.

Funding

- Is there a preference?
- One challenge is that we have a current system, countries have their own structures, labs etc. if we added all the money together, and spent it at one central location with 2 EU flagged vessels, this would be a solution within current funding. Impact in member states would be very large (closures / loss of jobs, etc).
- too many new initiatives, especially in IT. (databases, etc).

Data Availability

- INSPIRE Directive tells us that we should make raw data available. This may alter the situation in terms of data release. This will need a change in culture.
- JMP may need to make a recommendation – ie release all raw data.
- What is relationship between EMECO and Emodnet ??

General

- We understand importance of sea to our climate. Humans impact on it. It is a dynamic environment. To monitor this, no one country can do this alone.
- Scientists need to provide evidence of human impact to society, hence we need to work in sea basins.

Annex 10. Achieving joint monitoring from a scientific perspective-
Introduction to focus session by Gert van Hoey and Lisette Enserink



Session 2.
Achieving joint monitoring from a scientific perspective

Common indicators...

Harmonisation, standardisation, intercalibration ...

Scientific underpinning of the monitoring design ...

Use of innovative tools ...

PARTIM BENTHOS CASE STUDY

Benthic habitat assessment



Benefits for a regional assessment.

- Regional assessment required by the MSFD
- To assess large scale human influence (fishery, climate change, eutrofication)
- Benthic habitats does not stop at countries boundaries (E.g. Doggerbank)
- To detect shifts in the distribution of benthic species (e.g. ecological important species)

Currently, no common benthic assessment, indicators and monitoring protocol

WHAT CAN BE ACHIEVED?

Benthic habitat assessment Key scientific challenges



INDICATOR SELECTION?

- Issues: A wide variety of benthic assessment approaches exist and are nationally designed (metrics, targets and thresholds). Yet, those mostly rely on species-abundance information
- Solution: Basic metrics (i.e. species and abundance data) to be focused on
 - Dealt with within JMP Benthos case study

STANDARD OPERATING PROTOCOL HARMONISATION?

- Issues: Wide variety of (slightly) different SoPs in use, e.g. targeting different seasons, using different sampling tools, slightly different lab procedures,...
- Solution: Harmonised protocols for the collection and analysis of common data
 - Not dealt with within JMP Benthos case study: international coordination body needed (cf. fishery model), e.g. ICES Benthos Ecology Working Group.

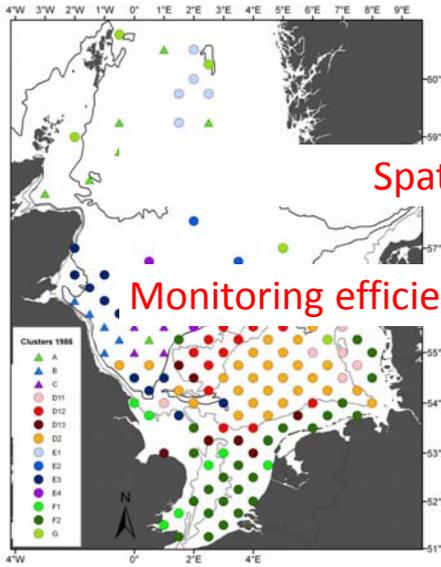
NORTH SEA WIDE SAMPLING DESIGN AGREEMENT?

- Issue: Locally focused sampling designs
- Solution: Move towards (sub)regionally focused sampling design
 - Dealt with within JMP Benthos case study

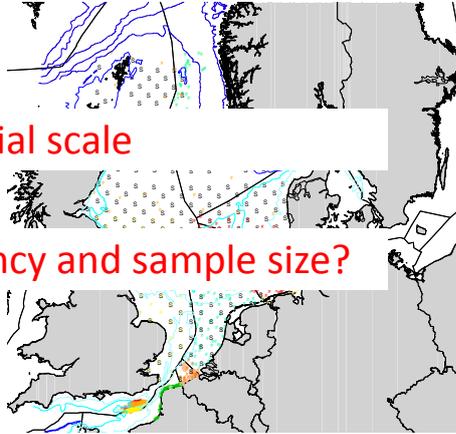
JMP sampling design



The North Sea Benthos Survey 1986 data



The North Sea Benthos Project 2000 data



Spatial scale

Monitoring efficiency and sample size?

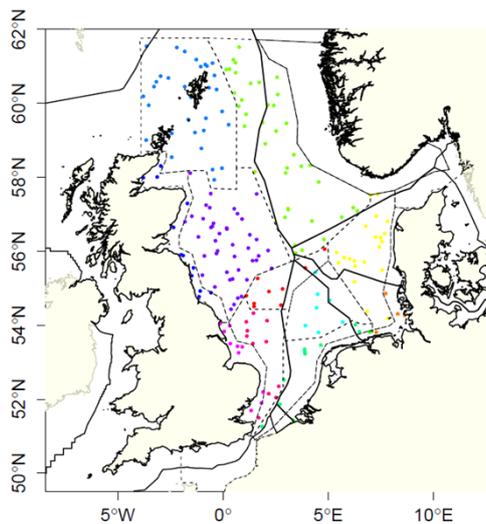
ICES – Benthos Ecology Working Group

JMP sampling design



Optimized design based on size of strata and variance within that strata

This design, delivers a higher ability to detect changes in the benthos compared to 1986, with the same effort.



Benthic habitat monitoring

Current state



Benthic monitoring is on national, local scale:

- Dedicated national surveys at MPAs and high pressure areas (risk based)
- Data from industry monitoring (e.g. windfarms, aggregates)

MSFD benthos programs in JMP NS/CS database:

Country	Type	# samples	Area
Belgium	Industry monitoring	150	
Netherlands	MWTL monitoring	514	Coast, EEZ
	Shellfish monitoring	855	Coast
UK	WFD monitoring	465	Coast
	National monitoring	??	EEZ
Germany	National monitoring	5-20	Coast, EEZ
Denmark	National monitoring	??	Coast, EEZ, beyond EEZ
Sweden	National monitoring	70	Coast, EEZ
France	??	??	??

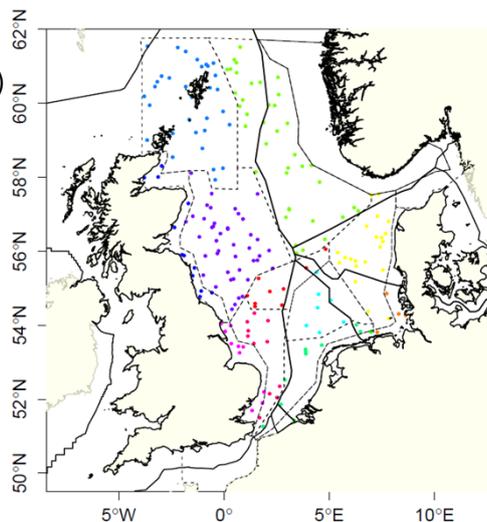
JMP sampling design



Optimized design based on size of strata and variance within that strata

Profit (better value for invested money) can be reached by financing international coordination for aligning the national survey's to create a common benthic dataset for the North Sea ecosystem.

The program need to collect habitat-stratified species-abundance data, seasonally fixed and on agreed protocols (ISO 16665 norm).



Session 2. Achieving joint monitoring from a scientific perspective

Common indicators...

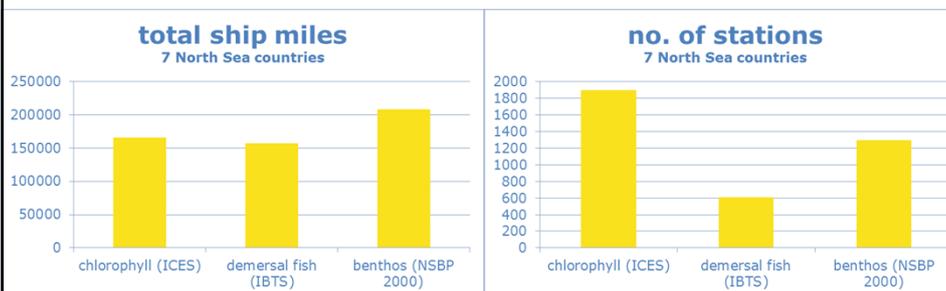
Harmonisation, standardisation, intercalibration ...

Scientific underpinning of the monitoring design ...

Use of innovative tools ...

PARTIM ChI A CASE STUDY

Case studies: estimated 'current' sampling effort in one year



Health warning:

- Simplified calculations of ship tracks, assuming 1 ship does it all and excluding distances to harbours.
- BE, DE, DK, FR, NL, NO, UK
- Chlorophyll: reported in ICES database (2006)
- Demersal fish: only IBTS sampling (Q1 and Q3, 2013); more fisheries surveys ongoing
- Benthos: voluntary collection of data from different sources, eg. to meet national monitoring, regulatory, or research needs (2000).

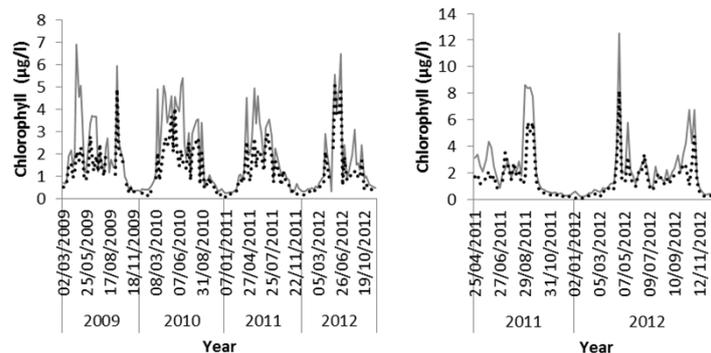
Note: updated version of presentation in Utrecht (19 March 2015), following corrections and new calculations in JMP NS/CS consortium.

Chlorophyll analytical methods

- Fluorometric/photometric methods (used predominantly) compared to HPLC (NL, BE only)
- Extraction method (acetone or ethanol) before analysis also varies
- Definition of common indicator 'chlorophyll a' depends on analytical method: inclusion of other pigments in fluorometry and photometry
- Attempt to convert seasonal means for SE waters to other methods: fluorometry/ethonal to HPLC/acetone differs 23%
- Considered unreliable for cross country assessments
- any future development of a conversion factor would require full validation and have to fully account for regional, seasonal and inter-annual variation of phytoplankton communities
- OR: use a single well-defined method

Examples comparison analytical methods

Comparison of weekly uncorrected chlorophyll concentrations determined by fluorometric methods (grey line) and chlorophyll 'a' determined using HPLC (dashed line) at the (A) Stonehaven and (B) Loch Ewe monitoring sites.

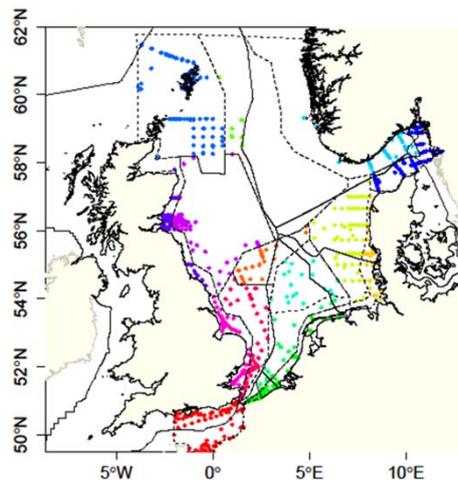


Ship based sampling of chlorophyll

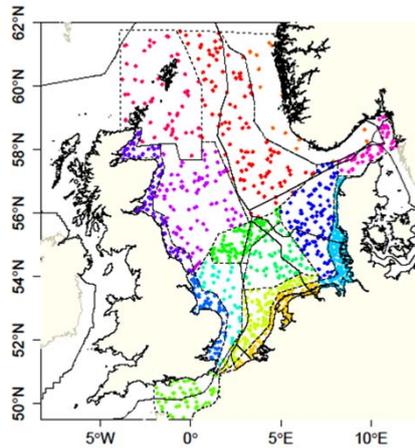
- Depending on country stations are visited once or multiple times a year, during and outside growing season (Mar-Sep)
- Collection of samples (water bottles) comparable
- Potential for joint sampling design using strata

Current sampling effort chlorophyll

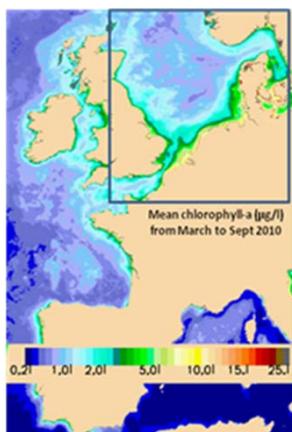
(ICES sampling programme; dashed black lines and color-coding of stations: boundaries of and measurements within strata)



Optimized ship based sampling design using strata



Remote sensing



- Figure: Mean growing season chlorophyll-a in 2010
- 17 years of daily images covering the whole North Sea
- Grid cells 1.2x1.2 km
- New satellites operational from 2016
- Issues:
 - interference with suspended material requires correction algorithms, especially in coastal waters
 - In some areas chl peak occurs in deeper water layers

Assessment for growing-season mean concentrations ($\mu\text{g/l}$) for all OSPAR areas in the North Sea, based on satellite observations

The colours indicate the status of the area concerning chlorophyll, depending on the corresponding assessment levels in Table 1. Red: PA - Problem Area; green: NPA - Non Problem Area; orange: PPA – Potential Problem Area.

ass level	Area	Assessment based on Remote Sensing					Overall OSPAR assessment	
		2001	2002	2003	2004	2005		
3.5	NO-Skagerrak coast	3.28	3.38	3.33	2.86	3.29	coast	="
1.5	SE-Inshore Kattegat	3.8	4.42	3.49	4.01	5.04	coast	="
1.5	SE-Inshore Skagerrak	3.3	3.3	2.65	2.81	3.18	coast	="
1.5	SE-Offshore Skagerrak	1.61	1.94	1.09	1.14	1.53	offshore	="
1.5	SE-Offshore Kattegat	1.9	1.99	1.41	1.66	2.4	offshore	="
7.5	UK-East Anglia (coast)	3.75	3.36	3.38	3.62	3.08	coast	="
5	UK-Southern North Sea	2.12	1.61	1.88	1.65	1.68	offshore	="
5	UK-Northern North Sea	0.84	0.75	0.68	0.68	0.73	offshore	="
7.5	UK-NE England (coast)	1.89	1.34	1.12	1.15	1.62	coast	="
7.5	UK-East English Channel	1.78	1.25	1.55	1.23	1.37	coast	="
7.5	UK-Eastern England coast	3.35	2.79	2.8	2.87	2.89	coast	="
7.5	BE-Coastal area	5.59	3.39	4	3.2	2.69	coast	="
4.2	BE-Offshore area	3.48	2.03	2.57	1.65	1.79	offshore	="
1.5	DK-North Sea	0.92	0.69	0.53	0.62	0.68	offshore	="
3.33	FR-North Sea Coast	7.57	5.09	6.49	4.7	3.75	coast	="
3.2	DE-North Sea	0.72	0.57	0.47	0.49	0.56	offshore	="
2.3	DE-German Bight	2.34	2.14	1.94	2.08	2.39	coast	="
2.25	NL-Dogger Bank	0.74	0.61	0.55	0.54	0.59	offshore	="
2.25	NL-Oyster Grounds	1.03	0.86	0.95	0.81	0.78	offshore	="
2.25	NL-Southern Bight	2.81	1.81	2.37	1.94	2.21	offshore	="
7.5	NL-Coastal Waters	4	2.69	3.07	2.53	3.55	coast	="

Next steps

- expand comparison of assessments based on ship sampling with RS, *cf.* OSPAR's Comprehensive Procedure (involve ICG-EUT);
- develop joint sampling scheme for calibration of RS, using TI statistical method and harmonised analytical methods;
- Explore use of ferryboxes for calibration

Routes to collaboration: multi use of platforms, an information platform and a living network

Ralf van Hal and Ingeborg de Boois

Institute for Marine Research and Ecosystem Studies (IMARES)

Marie Vanden Berghe and Steven Degraer

Royal Belgian Institute of Natural Sciences (RBINS)



Multi use of platforms



Ecosystem survey

WKECES

VS

Main objective survey + additions

WGISUR

JPI oceans

Workshop

Design an achievable joint monitoring programme for each case study:

1. Use existing non-dedicated surveys/programs
2. Filling gaps making use of industry/volunteers
3. Addition with dedicated surveys



Example Chlorophyll

- Water sample collection during Fish surveys
- Remote sensing
- Fixed sampling using oil platforms
 - Instructing volunteers to take the samples
- Extend Ferrybox sampling



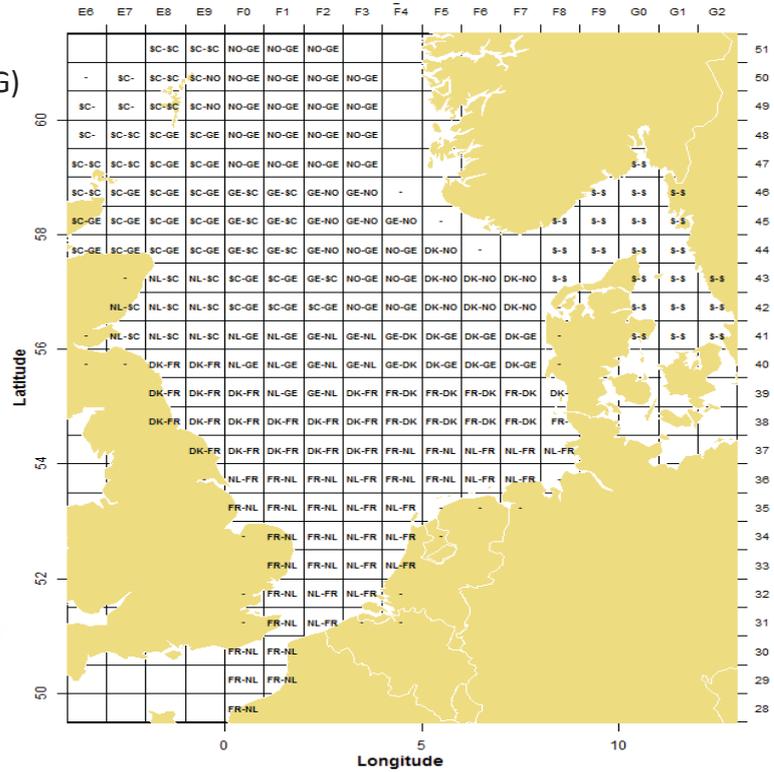
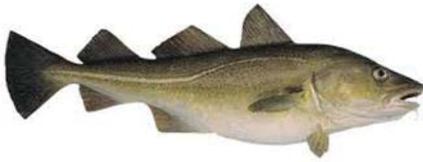
Example Demersal elasmobranchs

- Scientific fish surveys
- Observer programs
- Tagging: “Fish & chips”
- Collecting egg cases: “Egg case hunt”
 - Volunteers on the beach
 - Combined with sampling beaches for litter.



International Bottom Trawl Survey yearly coverage in Q1 & Q3

- Running since 1960s
- Organised internationally (IBTSWG)
- Fishing during the day
- Larvae at night
- All sorts of additional activities
 - Hydrology
 - Acoustics
 - Zooplankton
 - Litter
 - Diet studies
 - Benthos
 - Birds/mammals
- None really organised

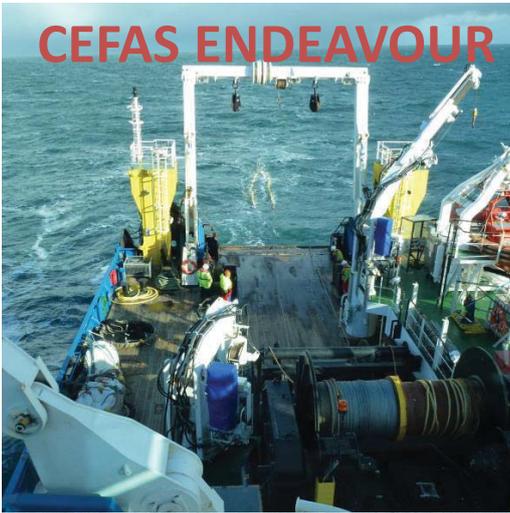


Hala: Tridens

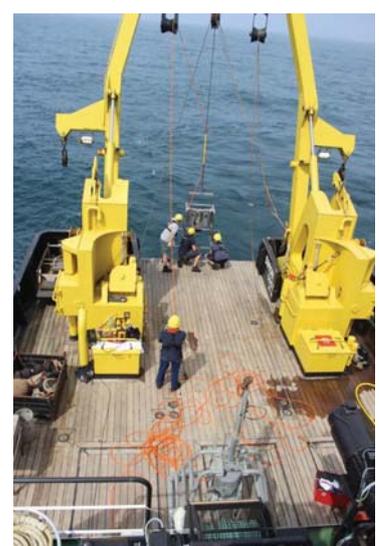


IBTS: END





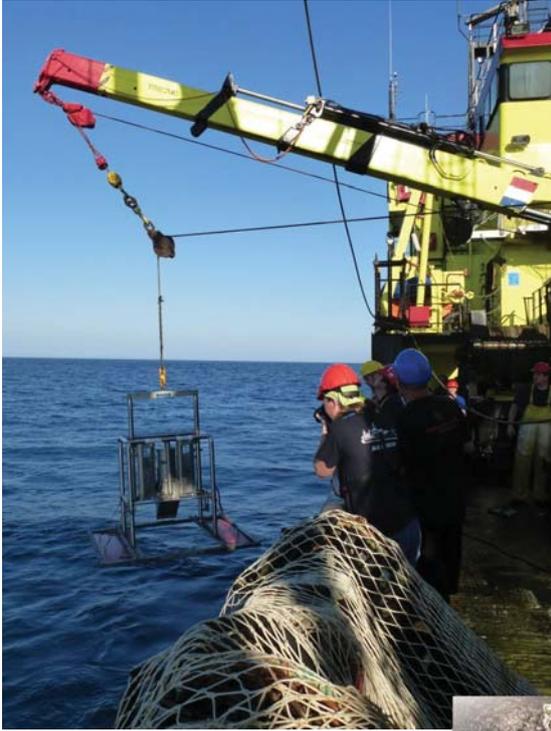
Benthos sampling with boxcore or dredge



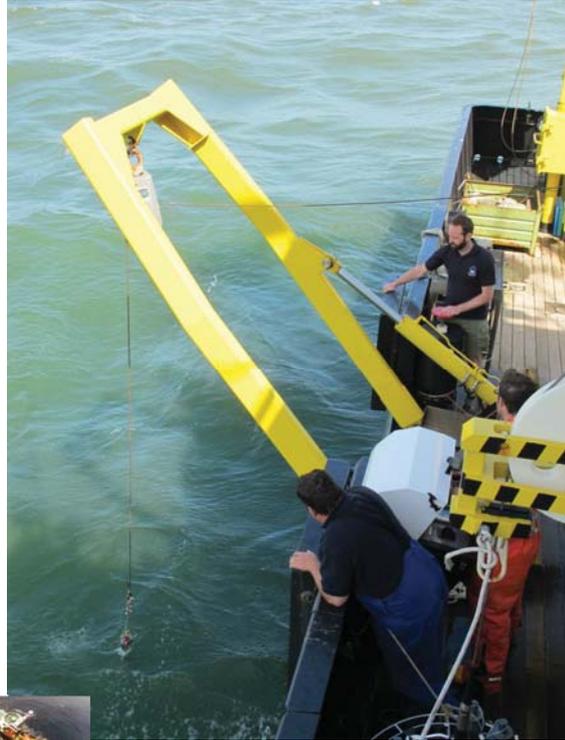
Tridens II

Simon Stevin

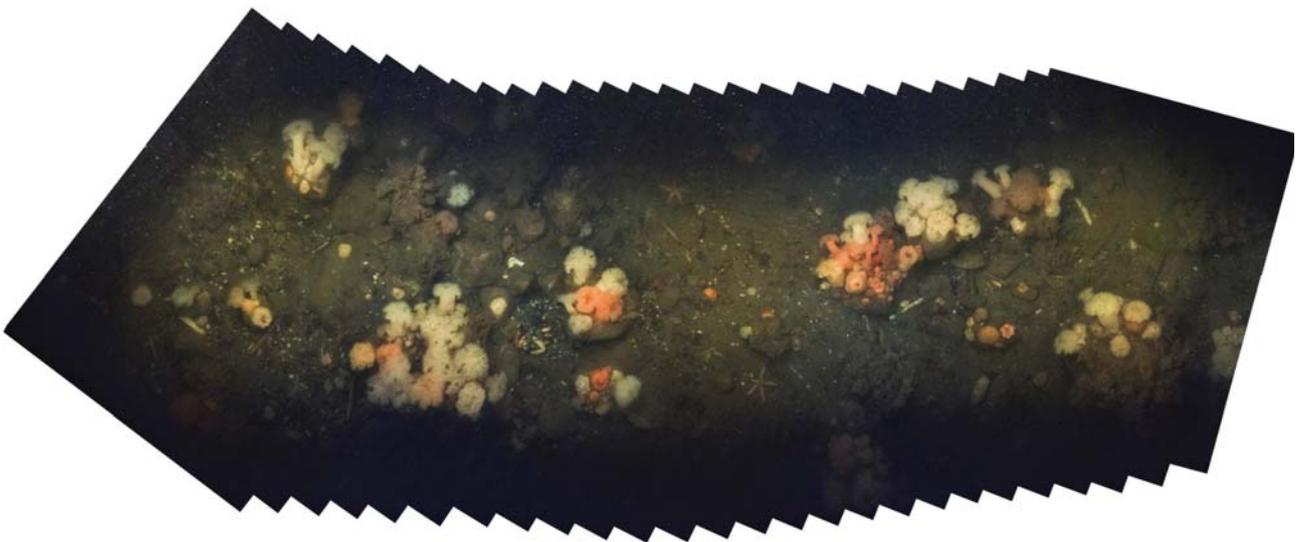
TRIDENS II



Simon Stevin



Benthos camera



Limitations/Risks

- A lot is possible in theory, but in practice?
 - Especially in good weather, but in bad weather?
- Prioritising on board: Main objective
- Expertise of crew
- Data quality
- Requires flexibility in programming
- Loss of expertise in a country

Costs

- Estimating costs appears difficult
 - Detailed information unknown hidden within larger budgets or not experienced as costs.
 - Competition
- Expectation: Cheaper than organising new surveys
- But there will be costs involved!
- Requires redistributing budget among institutes, ministries, countries

Task	MSFD descriptor related to											Fisheries survey for data collection
	1	2	3	4	5	6	7	8	9	10	11	
Fish and shellfish (survey specific)												
Organism collection (e.g. for contaminants, fatty acids analysis etc.)	x	x	x	x					x	x		trawl, acoustic and ichthyoplankton
Stomach sampling	x		x	x								trawl, acoustic and ichthyoplankton
Additional biological data (e.g. isotopes, liver/gonad weight, otoliths, scales, fin-rays, length-weight data of o)	x	x	x	x					x			trawl, acoustic and ichthyoplankton
Disease/parasite registration	x	x	x		x				x	x		trawl, acoustic and ichthyoplankton
Genetic information	x		x									trawl, acoustic and ichthyoplankton
Lipid content				x								trawl, acoustic and ichthyoplankton
Sonar observations pelagic fish				x								all
Tagging				x								trawl, acoustic and ichthyoplankton
Bioactive materials in marine species (e.g. for medical purposes)				x								trawl, acoustic and ichthyoplankton
Echosounder observations pelagic fish	x	x	x									all
Other sampling of fish/shellfish not taken in main gear	x	x	x									trawl, acoustic and ichthyoplankton
Physical and chemical oceanography (e.g. CTD, chlorophyll, oxygen, nutrients, turbidity, etc.)												
Continuous underway oceanographic measurements [from the ship]								x				all
Station oceanographic measurements								x				all
Continuous underway oceanographic measurements [autonomous devices]								x				all

Preparation	During survey							After	Boois, Ingeberg de: database developments for new data collection is not taken into account	Boois, Ingeberg de:	Documents	Analysis soft
	Additional equipment	Additional skills	Extra personnel	Extra shiptime	Facilities	Additional pers	Facilities					
no	no	dependent on the amount of sa	no	sample storage	yes	yes	x	x				
no	no	yes	dependent on the amount	preservation facilities, sample storage	yes	yes	x	x				
no	dependent on sampling type addi	dependent on the amount of sa	no	no	yes	yes	x	x				
no	knowledge of fish diseases/parasi	dependent on the amount of sa	dependent on the amount	dependent on data request: preservation	yes	yes	x	x				
sampling equipment, ethanol	training required to prevent cross	dependent on the amount of sa	no	dependent on data request: preservation	yes	yes	x	x	x	x		x
Fat meter; Calibration series for	skills for operation of the device	dependent on the amount of sa	no	dependent on data request: preservation	yes	yes	x	x	x	x		x
scientific sonar	skills for operation of the device	dependent on variables being c	no	data storage, synchronisation unit	yes	yes			x	x		x
Tags and fish handling	tagging skills	dependent on the amount of sa	dependent on the amount	fish handling facilities	yes	yes			x	x		
no	no	dependent on the amount of sa	no	preservation facilities, sample storage	yes	yes	x	x	x	x		
no	no	dependent on variables being c	yes (equipment calibration)	data storage, synchronisation unit	yes	yes			x	x		x
Alternative appropriate gear	no	dependent on variables being c	dependent on the amount	preservation facilities, sample storage	yes	no			x	x		
dependent on variables being c	skills for operation of the device	dependent on variables being c	no	dependent on the device used, pumped	yes	yes			x	x		
dependent on variables being c	skills for operation of the device	dependent on variables being c	yes (deploy/recover)	dependent on the device used	no	no			x	x		
dependent on variables being c	skills for operation of the device	operation of the device	yes (deploy/recover)	no	dependent on v	yes			x	x		

Overall comments

- Most existing monitoring is already multi-disciplinary, however not all data is used.
- Altering a program influences more than only the primary objective.
- Many opportunities to use downtime and spare capacity
- Organising requires flipthinking

Tools for designing a joint monitoring programme

- *An approach through case studies* -

Anne Sell, Francisco Marco-Rius,
Julia Wischnewski, Ingeborg de Boois & Ralf van Hal

Thünen Institute of Sea Fisheries, IMARES



18/19 March 2015, LEF future center Rijkswaterstaat, Utrecht

Objectives

Monitoring at a regional scale – why ?

- We are asked promote for our European marine ecosystems the Good Environmental Status (Marine Strategy Framework Directive).
- Due to the federal structure of the EU laws, each country is asked to report for their waters.
- *But:* Ecological processes are not restricted by national boundaries, and ecosystem understanding of the North Sea or the Celtic Sea requires an holistic approach.
- A Joint Monitoring Programme in EU Waters would:
 - Provide comparability of measurement methods
 - Thereby, truly complementary sampling by the countries involved
 - hereby, allow assessment of indicators of ecosystem status at the spatial scale relevant for management measures
 - AND: Allow optimization of effort invested through combination of various sampling programmes. Synergies by finding the best options for coupled monitoring of multiple indicators.



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Selection of Case Studies

We selected several case studies in the absence of readily defined and operational MSFD indicators.

Selection criteria:

- Of interest for the assessment of the status of the marine environment
- Coverage of a wide range of ecosystem components
- Choice which can illustrate important challenges in creating a joint monitoring programme

3 Case Studies:

Fishes: sharks & rays - Elasmobranchs

Benthic Invertebrates

Chlorophyll a (eutrophication)

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Case study 1: Sharks & Rays

Reason for choosing this case study:

Species of interest as possible indicators of ecosystem state. Different degree to which they are targeted by fisheries. Several species with conservation plans.

Opportunities:

- Existing international surveys; longterm data series.

Challenge:

- Data deficiency due to low abundances. Need to judge population status based on rare occurrence.
- Little access to additional data beyond the international fisheries surveys.
- Existing fisheries surveys have independent main objectives.



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Species considered in this case study:

	Species name	Abundance (North Sea)	Commercial Interest	Comment
1	<i>Amblyraja radiata</i> / Thorny skate	Abundant, rather wide-spread	No	
2	<i>Dipturus batis</i> / Common skate , Blonde ray	Low abundance, restricted range	No	Conservation of high importance
3	<i>Leucoraja naevus</i> / Cuckoo ray	Medium abundant, wide ranging on the western part of the NS	Low	
4	<i>Mustelus asterias</i> / Starry smooth hound	Medium abundance, wide range; seasonal variation	Increasing	
5	<i>Raja clavata</i> / Thornback ray	Range contraction in recent years: Themse estuary	High	
6	<i>Scyliorhinus canicula</i> / Lesser spotted dogfish	Most abundant species	No	High discard rates, high survival probability; good indicator for ecosystem, bad indicator for fishing pressure
7	<i>Galeorhinus galeus</i> / Tope	Low, patchy, area restricted	No	Largest shark species in IBTS survey; high vulnerability, low reproduction rate
8	<i>Galeus melastomus</i> / Black-mouthed dogfish	Common	No	Mainly at depths > 200 m

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Tools - Principles of sampling design: stratification & allocation of stations

Statistical approach - stratification

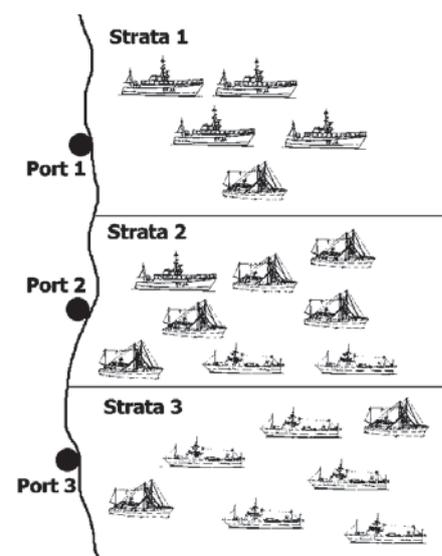
Goal: Most efficient sampling for an indicator

- Compromise between sampling effort and accuracy of result
- Sampling effort needed for same accuracy may be reduced through stratification

Process of stratification:

Sampling different subunits separately in order to obtain the best representation of the entire population - and hence the most accurate result.

In marine surveys, strata are typically spatial subunits of the entire survey area.

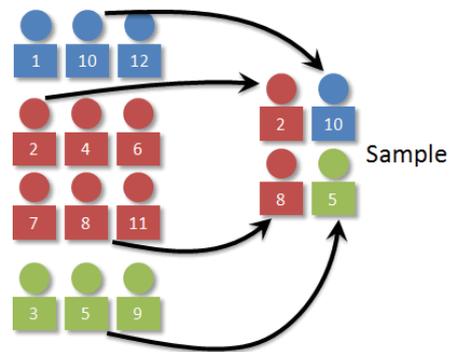


The variability between the strata is greater than the variability within the strata

Methods for allocation of samples

Allocation of stations between strata

- Different options exist for allocating stations to the defined strata.
- In JMP, we applied the Neyman allocation procedure, because it best most effectively maximized survey precision (reduction of variance).
- It takes more variables into account than just the size of the strata (as in figure =>)

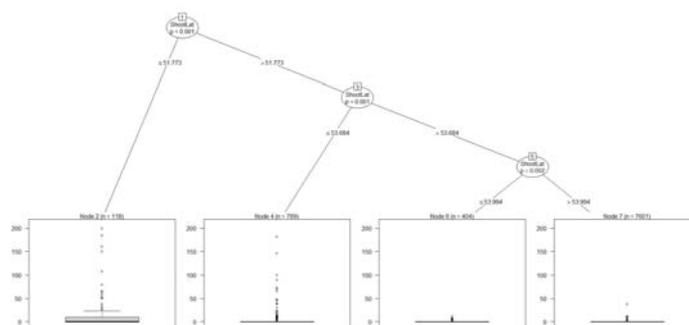


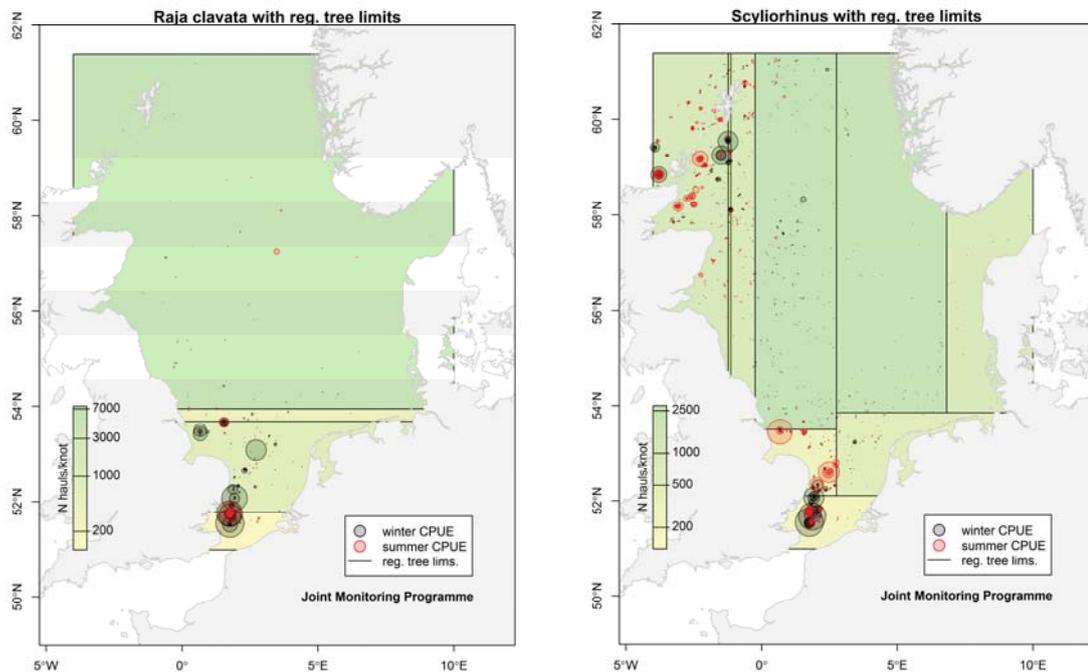
Case study 1: Sharks & Rays

Stratification for a single indicator:

A mathematical approach (regression tree) was applied in order to test whether the current sampling for sharks and rays could be improved. The current sampling occurs North Sea-wide, with stations spread evenly over the entire range.

This model demonstrated for the entire group of sharks/rays in the CS, or for individual species, that simple geographical structuring would improve the quality of their assessment.





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Optimization of sampling design for multiple indicators

Depending on the full suite of indicators to be monitored:

The concept of joint monitoring could be implemented best with different options:

- sampling many indicators with one ship
- sampling with several ships, where the ships conduct complementary parts of the monitoring programme

If multiple indicators are to be sampled together, a common sampling scheme is needed.

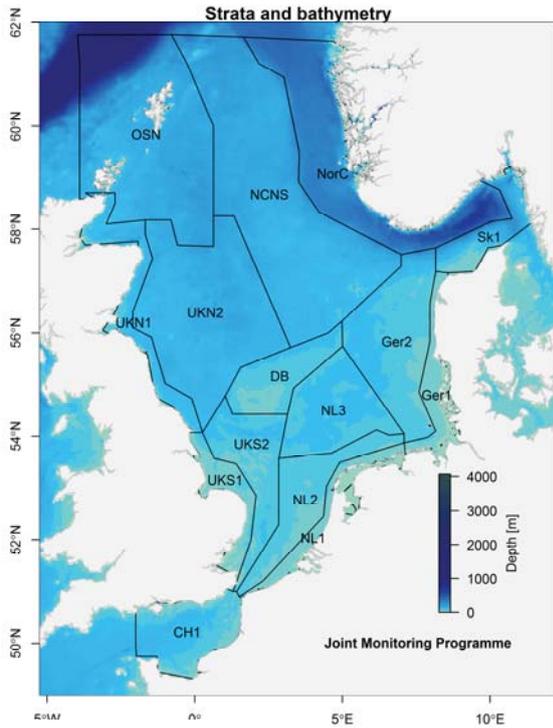


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Optimization of sampling design for multiple indicators



Stratification based on ecosystem characteristics

- Stratification based on a combination of parameters that remain rather constant over time => Ecosystem-based stratification
- We used the strata defined in the EU FP7-project VECTORS for the ecosystem model 'Atlantis' (Hufnagl et al., unpublished data)



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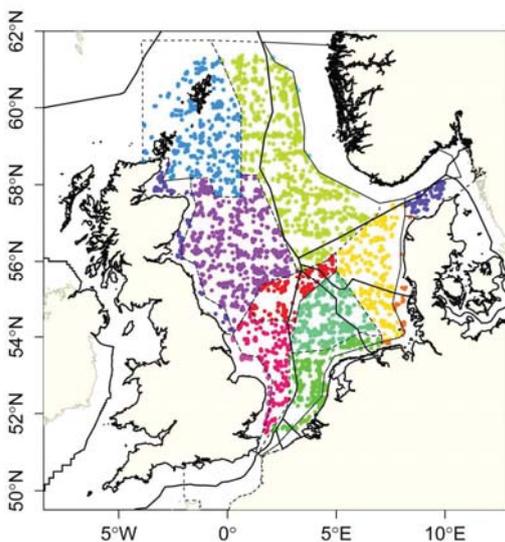


Raja clavata - Thornback ray



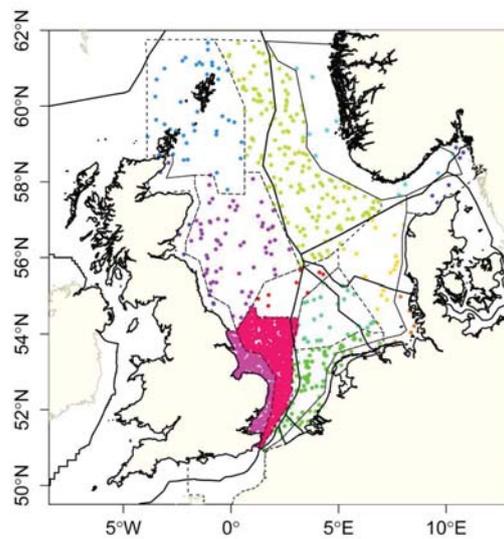
© Henk Heessen

Original sampling: IBTS Q1+Q3
(Combined data set, 2000-2013)



(Note that many of the stations are sampled repeatedly over the years; therefore one station symbol may stand for many sampling events.)

Optimized sampling effort and allocation

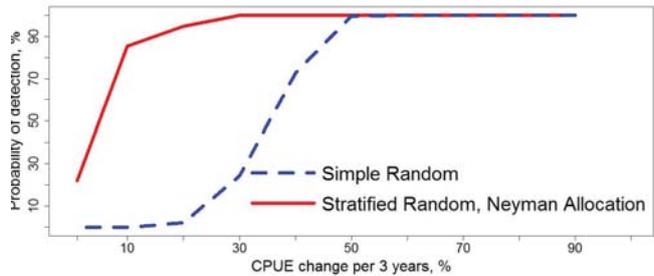


(Stations allocated randomly and therefore rarely overlaid; number of stations in the two strata off the south-eastern coast of England increased 'only' by 1.5-2.5x, compare to original).

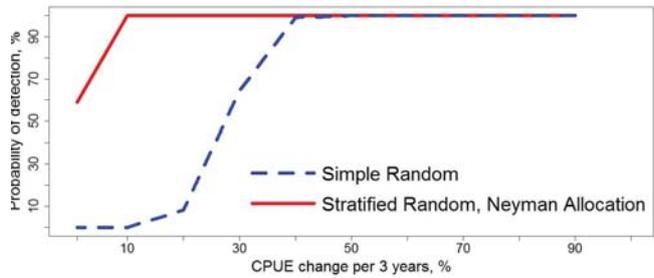
Raja clavata - Thornback ray



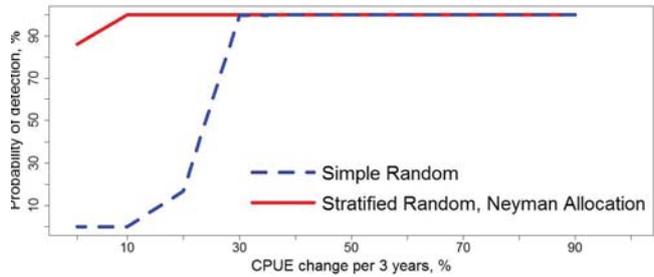
© Henk Heessen



800 stations per 3-year period
(~ 270/ yr)



1200 stations per 3-yrs
(~ 400/ yr)



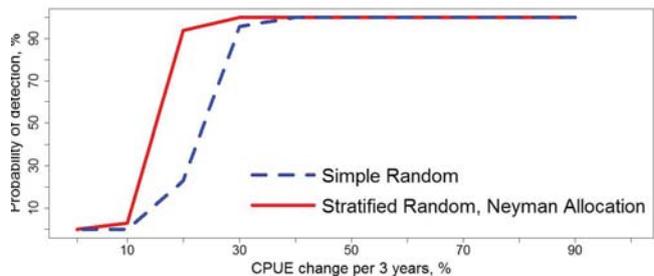
1800 stations per 3-yrs
(~ 600/ yr)

Conditions in this Case Study:
Zero-inflated and overdispersed catch data
=> negative binomial distribution model
=> temporal trend non-linear

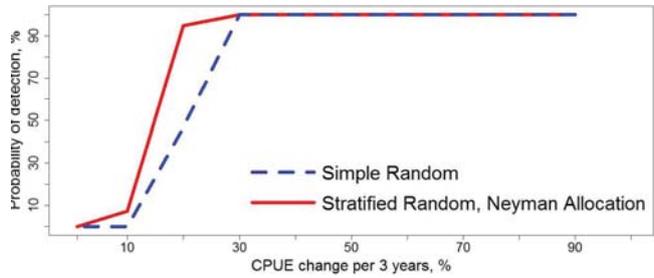
Scyliorhinus canicula - Lesser spotted dogfish



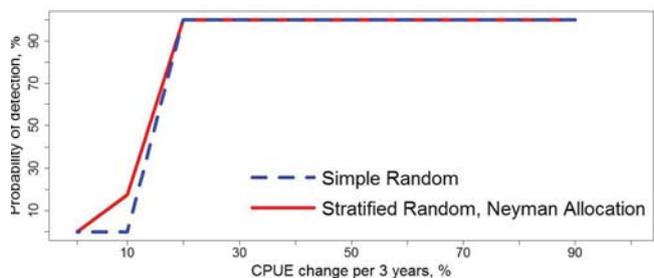
© Niels Daan



800 stations per 3-year period
(~ 270/ yr)

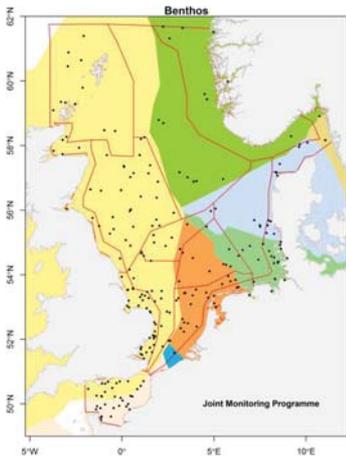


1200 stations per 3-yrs
(~ 400/ yr)



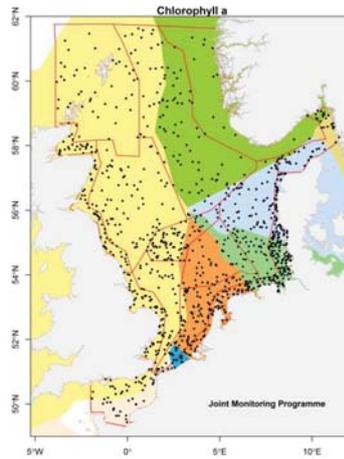
1800 stations per 3-yrs
(~ 600/ yr)

Conditions in this Case Study:
Zero-inflated and overdispersed catch data
=> negative binomial distribution model
=> temporal trend non-linear



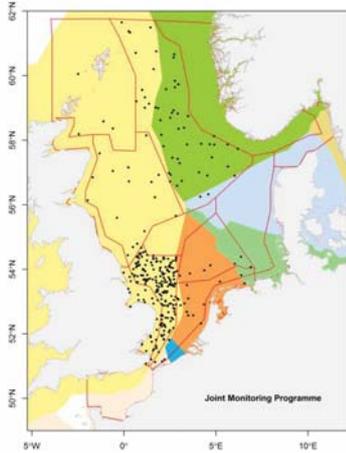
Stations

Benthos

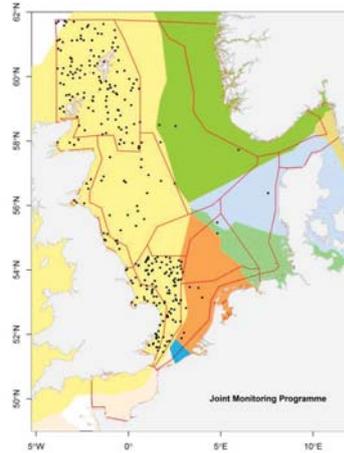


Conditions:
,Atlantis' stratification,
each map representing
1 survey for the respective
indicator

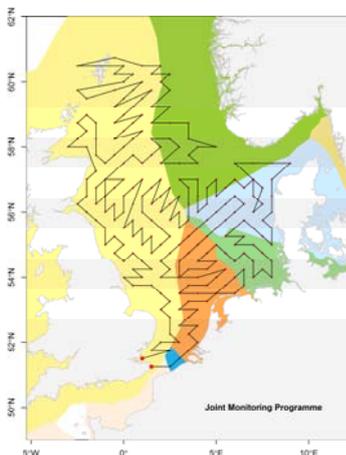
Chl. *a*



Raja clavata



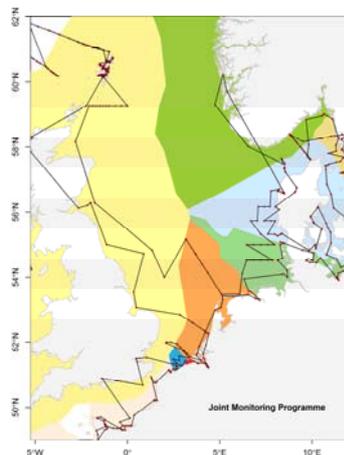
*Scyliorhinus
canicula*



Ship tracks

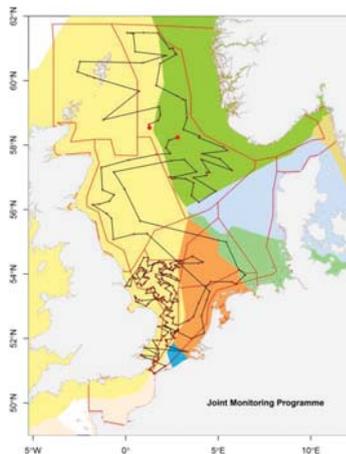
As measure of
survey effort

Benthos

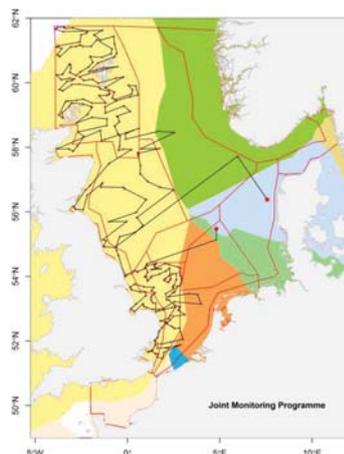


Conditions:
,Atlantis' stratification,
each map representing
1 survey for the respective
indicator

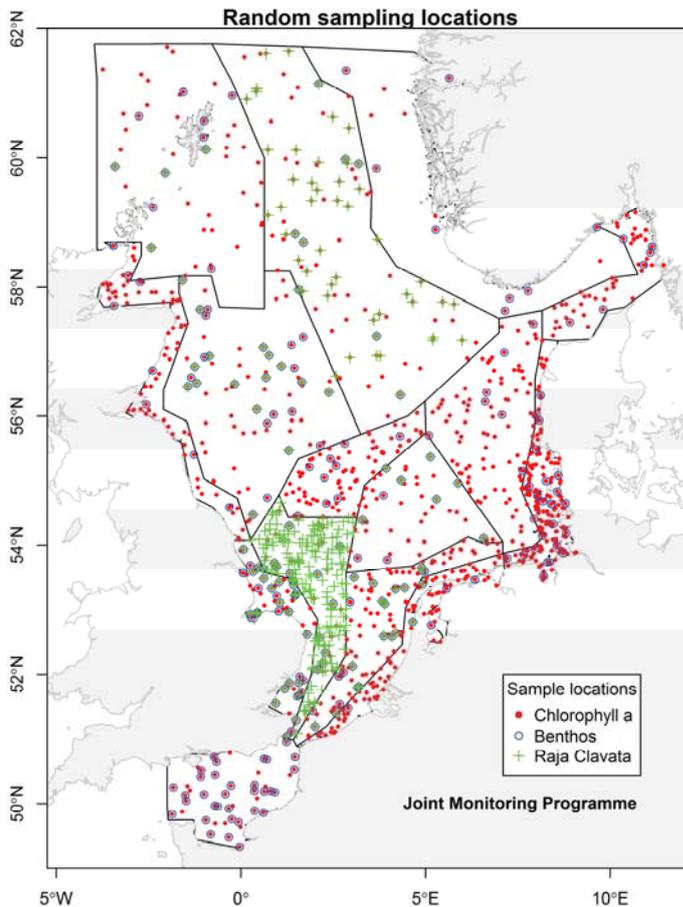
Chl. *a*



Raja clavata



*Scyliorhinus
canicula*



Joint monitoring program

for three case studies, based on ecosystem-based stratification ('Atlantis'), and allocation of stations to the individual strata according to Neyman approach.

Stations in map: samples recommended per case study for one common sampling event.

Total station number is reduced where possible through combined sampling for 2 or 3 case studies.

Stations per indicator, here:

Chl. a: 1073

Benthos: 218

Raja clavata: 300

Optimization of sampling design for multiple indicators

- Analysis of effectiveness: Compare options for joining the sampling for multiple indicators: here by the example of case studies. Much better options for useful combined sampling will exist if the true MSFD indicators (many more) are defined.
- Which pattern of splitting the tasks between ships is optimal? Depends on additional parameters, such as: expertise needed on board, technical equipment of the available ships, temporal frequency of the sampling for individual indicators.

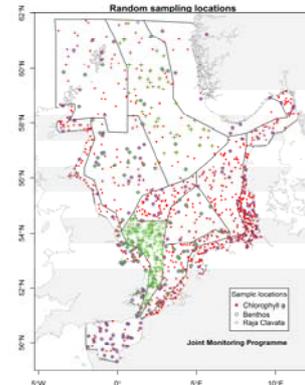
Avoidance of redundancy & optimal survey design

Cost-benefit analyses have been performed through the analysis of the sampling effort / ship time needed for the respective sampling activities.

These analyses have been done for single indicators, looking at the possible benefit from a change in sampling design through stratification and sample allocation.

The same tool is available for analyses to be performed for the combination of sampling for multiple indicators in a joint monitoring programme.

=> Effort can be reduced substantially



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Summary



- We developed tools – using visualization and statistical techniques – which can be applied to optimize the sampling for MSFD indicators.
- Tools have been demonstrated for selected case studies, but are ready to be adapted for “real” MSFD indicators.
- Various ecosystem parameters are currently monitored in the North Sea, and for many individual indicators, the sampling design could be optimized (e.g. by a simple geographical stratification by lat/lon).
- If many indicators are to be assessed in a JMP, an ecosystem-based stratification was found to be most suitable (‘Atlantis’ strata)



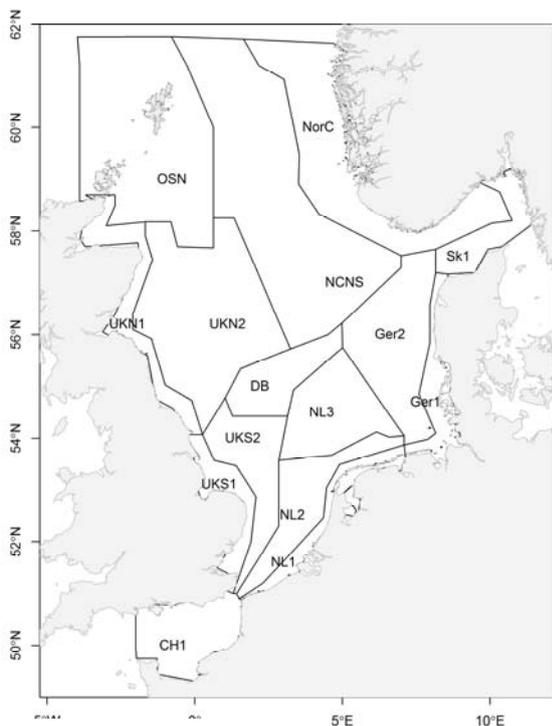
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- A JMP allows for sharing of resources (ship time); cost-effectiveness analyses have been conducted for different options.
- In reality, the possibilities for combinations will become better as more indicators are operational and can be considered jointly.
- A most efficient JMP may then select the best option for the monitoring, which could involve several joint assessments for the indicators, for which the benefit of joint sampling is highest.
- Different combinations could be useful for different seasons or even years, depending on the required frequency of the individual assessments.
- The project JMP provides the tools to optimize a future REAL Joint Monitoring Programme.



18/19 March 2015, LEF future center Rijkswaterstaat, Utrecht

Optimization of sampling design for multiple indicators



Stratification based on ecosystem characteristics

- Stratification based on a combination of parameters that remain rather constant over time => Ecosystem-based stratification
- We used the strata defined in the EU FP7-project VECTORS for the ecosystem model 'Atlantis' (Hufnagl et al., unpublished data)



Annex 13 MMS question 4

What is your insight?

- 1 Still a very long way to go before widespread joint monitoring **DL** 3
- 2 Perspectives for societal and ecological benefits of JMP are too important, to let JMP be overruled by (trivial) issues related to lose of national, institutional or personal sovereignty. **EC** 3
- 3 Possible but difficult **DL** 2
- 4 In general, I think we all want to share more and make things more jointly, but it will take time !! **DL** 2
- 5 Financial system (DCF model) may be important driver in starting joint monitoring **A** 2
- 6 A road map to joint monitoring is defined, let's start to tackle the barrières step by step **JS** 2
- 7 There is scope for lots of small steps toward JMP without getting bogged down by the issues preventing us from the big step **JS** 2
- 8 Opportunities **JS** 2
- 9 Several inspiring building blocks for joint monitoring have code out of the working groups. The challenge now is to turn it into an agenda for developing joint monitoring starting directly after the project and ready fo the following planning period **JS** 2
- 10 the real work is just beginning. Successful communication is one of the most important aspects. **JS** 1
- 11 Working together is a must, on research data and on asset use **EC** 1
- 12 Get beyond ME, MY job/monitoring, MY institute, MY country and start from an ecosystem view to achieve joint monitoring. Looking from space, that's still quite detailed **EC** 1
- 13 Constructive EU input needed **A** 1
- 14 Chl is different from the otherness two concerning monitoring plan **FP** 1
- 15 Still along way to go towards joined monitoring **DL** 0
- 16 We work better together **EC** 0
- 17 What,s the way forward so we really could coordinate the ongoing monitoring? What kind of breakthrough we want to reach? **JS** 0
- 18 make better use of our resources **JS** 0
- 19 Science dilemma. Choosing between your job and joint **EC** 0
- 20 Everyone positive for joint efforts and thinking. Question is how far we want to take it. **A** 0
- 21 Monitoring have to include status and pressures **A** 0
- 22 Science, management, and politics are sometimes different planets **DL** 0
- 23 It's really important to make sure that every bit of resource use has justification and that monitoring jointly is thought into all aspects to ensure optimal use of resources. But it doesn't look easy. **DL** 0
- 24 We need a disaster to force the process **A** 0
- 25 The tree case study need different monitoring plans **FP** 0

26	Who will take the responsibility to really start the coordination? JS	0
27	Joint monitoring is for the future and for next year JS	0
28	Joint monitoring is more than just a steep hill to climb - it's a mountain which summit might not be reached in decade just to find the way up is difficult DL	0
29	Joint monitoring possible, even for different aspects of the ecosystem FP	0
30	A long way to go still DL	0
31	Distinguish the different levels to what the monitoring has already developed for various objectives (commercial fish species, hazard substances, mammals, etc FP	0
32	Talking must stop. We need to now build upon the basis JMP NSCS has established JS	0
33	Where is the limit? North sea, eu...? EC	0
34	It's hard to get the policy level involved, convinced and DL	0
35	There is so much we can change, just by listening to groups with other expertise and understanding there background and baseline levels JS	0

The answers were categorised in five groups, the number of answers in each category are given as well as the percentages. Behind the answers these categories are shown in red as well as the number of likes.

DL = Difficult and long way to go	nr=9	ca 25%
JS = Do it _ just start	nr=11	ca 30%
EC = Argue from ecosystem view and we, and not me/us	nr=6	ca 20%
FP = Design fit for purposes	nr=4	ca 10%
A = money and all other drivers	nr=5	ca 15%

Which parts from this focus session could you use to enhance joint monitoring?

- | | | |
|---|---|---|
| 1 | We need to persuade member states to work through Regional Seas Conventions because scientists, policy makers and managers all agreed international coordinated monitoring is likely to be both cheaper and more scientifically robust. | 1 |
| 2 | Including the database in the EU reporting cycle will help the viability of the database as well as integrating it with the database of the BALSAM sister project | 1 |
| 3 | The stratify approach is the right way to have a good regional assessment | 0 |
| 4 | Applying North Sea wide statistical tools seems promising for more efficient sampling design for the whole North Sea, some hurdles are integrating frequency of sampling and use of other platforms, methods. | 0 |

What do these results mean to you in terms of future collaboration in monitoring?

- | | | |
|---|---|---|
| 1 | Future collaborations and standardization gives increased data quality | 0 |
| 2 | Sharing data and information is a big step towards international collaboration. For me the searchable database is one of the golden outcomes of the JMP project. Can we persuade the Commission that this should replace the un-searchable eionet database? | 0 |

Annex 14. MMS question 6

Which Actions?

- | | | |
|----|--|---|
| 1 | If we can't wait for policy makers and managers to make this official then we can all make small progressions toward JMP everyday by making it a dogma in our everyday work. | 7 |
| 2 | Collaboration with nearest neighbour | 6 |
| 3 | Start with the virtuel north sea institute. | 6 |
| 4 | Don't wait for something to happen all by itself, dare to set the first step yourself within your circle of influence | 5 |
| 5 | Persuade policy advisors and makers to think 'coordinated and regional' monitoring and assessment first, and only consider national as a last resort. | 5 |
| 6 | Really start with the virtual northsea organisation to coordinate these issues? The plans are there! | 5 |
| 7 | Keep the living network of North Sea monitoring institutes and let them collaborate on a regional scale for environmental and fishery issues | 5 |
| 8 | Develop an agenda or action plan based on the outcomes of the project and the living network to develop joint monitoring for MSFD during this planning period. | 4 |
| 9 | Our seas are fundamental to human wellbeing. As humans we place significant and increasing pressures on ours seas. We need to understand these pressures and their impact on state. | 4 |
| 10 | Develop a short set of pragmatic options (maybe 5 max) to follow up JMP NS/CS | 3 |
| 11 | Documentation of same regional info (monitoring/assessment) for less money through joint monitoring | 3 |
| 12 | We are operating in a mobile system and so cannot simply focus on 'our country'. As such we need to bring our knowledge and resources together to operate on the scale of the pressures so we can provide the evidence to change cultures. | 3 |
| 13 | Smart actions for implementing joint monitoring starting tomorrow | 3 |
| 14 | live it | 2 |
| 15 | How to approach the politicians in a non scientific way to make understand the advantage of JPM. Are we as scientists able to do this at all? | 2 |
| 16 | Create willingness to change national traditions for certain purposes | 2 |
| 17 | Be the change that you wish to see in the world (Gandhi) | 2 |
| 18 | What existing fora can be responsible for taking the next step for different tasks, and when ? | 2 |
| 19 | Understand the governance and institutional issues that enhance or prevent JMP | 2 |
| 20 | Are we working for the ecosystem (save life) or for the system (save money) ? | 2 |
| 21 | Compare schedules across nations | 1 |
| 22 | Makeuse of the momentum and struggle from msfd! The largest call is the call for HELP! | 1 |

Annex 15. MMS outcome break out session

The answers entered in the MMS were grouped according to the theme. The first figures before the answers are the theme numbers and the numbers behind the answers the number of likes. Besides the feedback by MMS also Flip Over feedback was provided this is included in the report.

What is the outcome of your break out session?

Name the subject first.

1. Think international before you think national

- | | | | |
|---|----|---|---|
| 1 | 13 | International ship collaboration (NED, ENG, BEL?) and collaboration between ship's owners and scientists. | 2 |
| 1 | 26 | Think International before you think National | 1 |

2. How to become friends with your policy maker?

- | | | | |
|---|----|---|---|
| 2 | 10 | Reasons to stop us from thinking international:
- lack of funding to attend international fora
- national obligations rate higher for ministries therefore certain reluctance to think internationally in the first place | 3 |
| 2 | 20 | Friends with policy makers: common understanding of need for JM starts with joint understanding of GES, incl targets. | 2 |
| 2 | 31 | Friends with policy: if you don't know your PM good enough, map Marine Director and related people with your institute. | 0 |

3. Virtual North Sea institute

- | | | | |
|---|---|---|---|
| 3 | 5 | NSvMI. Start small and concrete. Use benthos as first case. Avoid Interegg. Use ICES/OSPAR frameworks. Start club of weekly skype meetings. | 4 |
|---|---|---|---|

4. Collaboration with your nearest neighbour

- | | | | |
|---|---|--|---|
| 4 | 4 | Find the right contact person(s), compare similar monitoring programs, and check timing of monitoring, then take intercalibration further. | 4 |
|---|---|--|---|

5. Living network

- | | | | |
|---|----|---|---|
| 5 | 3 | living network = contacts, LinkedIn Group | 4 |
| 5 | 6 | The people here in the JMP project are the living network, who can effect change in an evolutionary way; e.g. collaborating at the small scale to begin with e.g. with neighbouring countries to demonstrate it works | 3 |
| 5 | 9 | Living network - write instructions for people attending international workshops stressing the guidance and reporting back the steps taken. | 3 |
| 5 | 11 | Living Network: maintaining the already existing energy of the group | 2 |
| 5 | 14 | Living network: searching for H2 coordinate further JM. For different quality elements. Across platforms. | 2 |
| 5 | 15 | Living network: what can members from the network bring back to the working groups of OSPAR / own organisation. | 2 |
| 5 | 17 | Living network: have the checklist Towards JM in mind | 2 |
| 5 | 18 | Living network: have a list of names of participants + in which fora you are involved. LinkedInGroup. Who are lacking? What are gaps? | 2 |
| 5 | 21 | Living Network for Joint Monitoring - do we need a new group? Often it is the same people attending working groups and international projects anyway. | 1 |
| 5 | 22 | Living Network: more official network meetings, symposia and projects | 1 |
| 5 | 23 | Living network - platform catalog of examples that can be done | 1 |

5	24	Living Network - Network can be supportive to working together as neighbours	1
5	25	Living network: communicate with colleagues neighbouring countries.	1
5	30	Living Network - Why should we do this living network? - communicate, spread the word - make sure that steps of the checklist table are applied. E.g. The bethos case study. - lobbying - thoughts can be brought to the virtual network	0

6. Concrete actions that each user group can take, identify low hanging fruit (i.e. Prioritisation) and execute...

6	1	Internally discuss joint monitoring in the institute, send round the 10-pager to colleagues, slowly getting people on board	5
6	2	Incorporate joint monitoring in annual (national) monitoring plans to be implemented in next MSFD period. Needs (financial) support and clarification on the amount of capacity, money, benefits, etc.	5
6	7	The MSFD could be re-interpreted by the Commission to have less emphasise on responsibility at the national level and more on the regional level	3
6	8	Present the JMP results to colleagues, and inform that the guideline is that you should do joint monitoring	3
6	12	Use the personal network of the scientists. Troubleshooting happens at the practical level. Work goes on even when there is some hick-up along the line on the political/management level.	2
6	16	Convince ICES Science Committee to agree on the proposal for an ICES workshop to create an integrated survey in the North Sea based on the current time,space,shiptime of IBTS Q3, taking into account the current and new objectives	2
6	19	- adopt ICES approach to develop international monitoring programmes	2
6	28	Present JMP results to MonitBE (responsible for MSFD in Belgium), to slowly get people on board	0
6	29	SMHI staff to SLU trip to collect more data then SLU does on their own cruise	0
27	27	- if it is a new parameter to be monitored develop monitoring in an international context (good example to start with: marine litter) - for established monitoring develop intercalibration between national programmes	1

programmes understanding
intercalibration collaboration
working joint develop
more start
living people
between results colleagues ices group level case first slowly msfd national
small fora jmp need jm back
countries meetings who board own further
monitoring new friends
current groups steps neighbouring scientists
network
international
attending present policy institute
checklist

Annex 16. Introducing the North Sea virtual Marine Institute

Introducing the

NS_VMI

North Sea Virtual Marine Institute

Who is in the NSvMI ?

If I have missed your logo – many apologies !!



But what does NSvMI do ??

We start operating like a single, coherent but virtual North Sea Institute gathering data for the MSFD

Objectives

Better data

Better value for money

Happier staff

Remember This ?

Reaching a Definition of a Joint Monitoring Programme (JMP)

Definition of a Monitoring Programme

The measurement of one or more metrics describing an aspect, or aspects, of the marine ecosystem in a specified region and which is performed at one or more locations in space, but repeated in time.

The measurements are performed following a specified method which does not change with time without an analysis being performed on the quantitative effect of any change.

A monitoring programme performed by more than one organisation.

Definition of a Joint Monitoring Programme

Activities Expected in a JMP

Operational Objectives of a JMP



Activities Expected in a JMP



- *shared platforms*
- *shared equipment*
- *joint training programmes*
- *joint planning meetings*
- *joint programme management*
- *inter-organisation personnel exchange*
- *inter-organisation calibration studies*
- *shared data infrastructure (eg databases)*
- *shared assessment procedures*
- *joint assessments*
- *joint reporting*
- *joint funding mechanisms*
- *joint resource allocation*

Activities To Be Undertaken by NSvMI

- shared platforms
- shared equipment
- joint training programmes
- joint planning meetings
- joint programme management
- inter-organisation personnel exchange
- inter-organisation calibration studies

~~shared data infrastructure (eg databases)~~

????? ~~shared assessment procedures~~

~~joint assessments~~

~~joint reporting~~

- joint funding mechanisms

- joint resource allocation

2016 - 2018

Focus on MSFD Monitoring

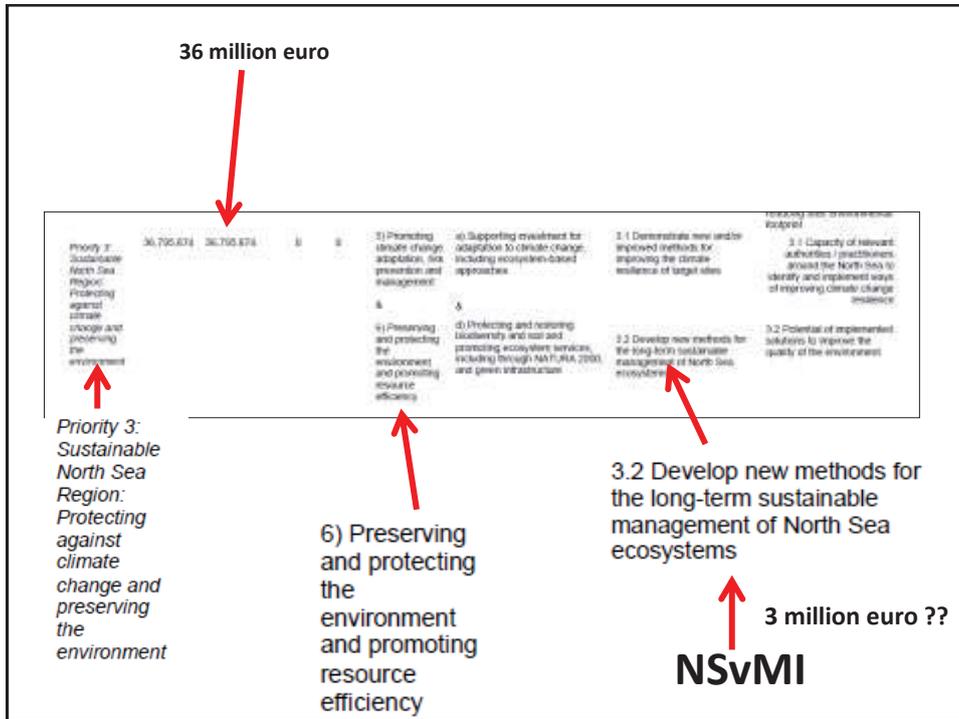
Where do we get the funding ?



North Sea Region 2014-2020: Vision

Joining efforts to lead the way to stronger, more sustainable economies and societies around the North Sea

The programme aims to embed greater cooperation in working practices across the North Sea Region (NSR) as a way of tackling joint challenges, pooling expertise and building lasting links between businesses and institutions throughout the NSR.



Intereg have funded such a thing before !

**The North Sea
Region Programme
2007-2013**

Welcome to the official North Sea Region Programme
The North Sea Region Programme 2007-2013 works with region
projects around the North Sea. Promoting transnational cooperation
aims to make the region a better place to live, work and invest

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A "virtual" University



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Swedish Environmental Institute

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Maritime Development Center of Europe

IVL Svenska
Miljöinstitutet

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NS_vMI

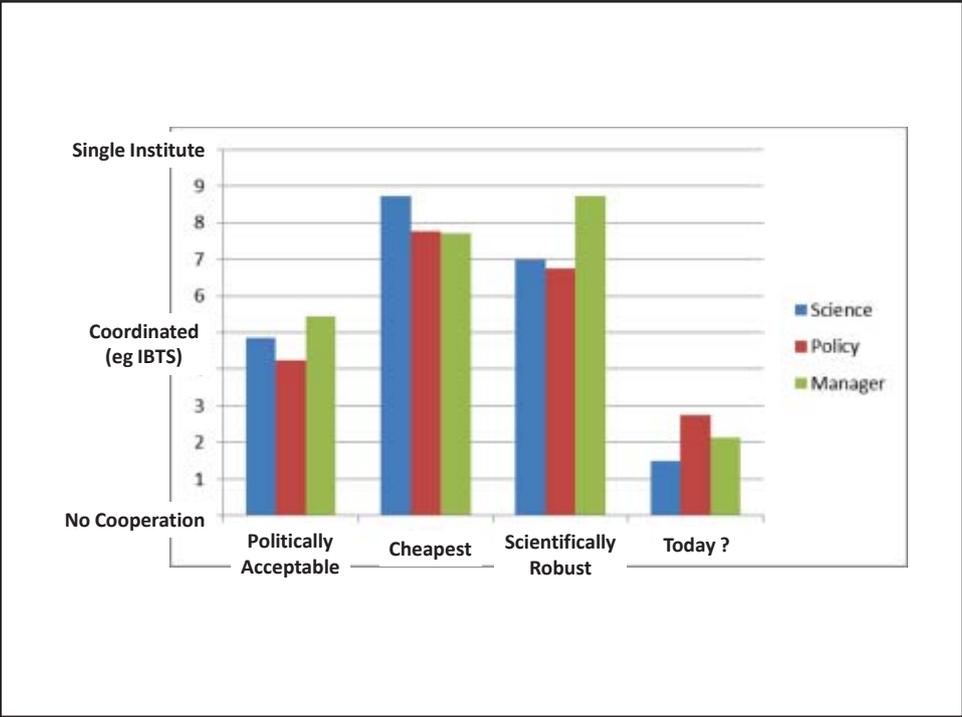
Is this a sensible idea ??

North Sea _{Virtual} Marine Institute

Are you interested in joining a bidding consortium for
Interreg North Sea Programme money ??

Call dates not yet published – summer 2015 ??

Email Bill and let me know your thoughts



NS v MI	Strengths	Weaknesses
	Get 65% cost back	Needs top-down commitment Alienates ICES/ OSPAR ?
ICES/OSPAR WG-NSVMI	Strengths	Weaknesses
	Bottom-up approach Uses regional mechanisms	Additional costs
North Sea Institute Directors Liaison Group <i>The "Utrecht Protocol" ?</i>	Strengths	Weaknesses
	Management commitment	Additional costs Have to inspire (instruct) staff
Do Nothing	Strengths	Weaknesses
	Peace and quiet	Failure